



MANOR ACADEMY

**Year 10 Summer Learning Support
Booklet 2023**

Dear Families,

As we now move into their final year before their GCSE/BTEC exams we at the Manor Academy want to provide as much support as possible to ensure your child achieves their very best. To support this, we have produced a home learning pack to be completed in the summer break. This is supported by research from **The Education Endowment Foundation** that shows that homework has a positive impact on student progress, it can help your child gain up to 5 months additional progress on top of their classroom learning. Additionally, it is also proven that long periods of inactivity lead to a loss in students' knowledge and skills therefore the learning support pack will enable your child to keep their brains ticking over through the extended break.

The pack contains English, Maths, Science, History or Geography and RE.

We have designed the tasks to fit around topic areas all students will be familiar with and have also identified from the recent Year 10 assessments that there might be a need for some extra revision on some topics.

All the topic areas will be needed for the coming year studies. The completed booklets will be required to be handed into to their tutors when they return in September. There are only 28 teaching school weeks before the start of examinations and therefore I would be very grateful if you can continue to encourage your child to complete all the relevant sections and be fully prepared for the new school year.

The Subjects

English Language & English Literature

Successful completion of this homework will enable you to close the specific gaps which have emerged post end of year assessment. The remedies focus on the high tariff questions or those which were marked lowest across the year group. Crafting your creative writing is important in creating a compelling narrative and using 'Upgraded Sentences' allows you to demonstrate a variety of punctuation. By also perfecting your PEEL and PEELAP style paragraphs, you'll be equipped with the skills and knowledge to score highly on the evaluate question. Take your time to revise over the 100% sheets and you will be able to complete all of the tasks successfully.

Maths

Students perform higher in Maths when they practice Maths. If you're a keen runner doing little to no running would result in decline to your time. The analogy is the same in Maths: 5 weeks without doing Maths will have the same effect. By completing the learning tasks set you will be working through appropriate, remedies and ensuring pre-requisite knowledge is secure before you start in September.

Science

Successful completion of this homework will enable you to review, key powerful knowledge and feel confident in key scientific concepts of biology, chemistry, and physics. These are challenging topics, but the more you re-call the knowledge and explain your scientific ideas behind these concepts the better you will be able to master it! Take your time to revise over the 100% sheets and you will be able to complete all the tasks successfully.

History or Geography and RE

There are many key areas of the Humanities syllabus, and depending on whether you are studying History, Geography or RE, we have identified some targeted areas which we believe will really help you to be performing higher student in the coming year. By undertaking and completing these learning goals you will be in well prepared to learn for the start of your humanities lessons in September.

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Language Paper 1

1. The Paper	
Q1 4 marks	List 4 things (5 mins)
Q2 8 marks	How does the writer use language to describe? (15 mins)
Q3 8 marks	How does the writer structure the text to interest you as the reader? (15mins)
Q4 20 marks	[statement] To what extent do you agree? (25 mins)
Q5 40 marks	Writing to describe or narrate (45 mins inc. planning time and checking time)

2. Pre Exam Tips

Read the blurb given for the text.
Highlight key words which given you a clue about what you will be reading e.g. character, setting, time.

Read the passage carefully. Take time to make sure you understand it and highlight as you go.

3. Question 1

Read the question and highlight the key words, including the lines it asks you to focus on.

Draw a line down the side of the lines you need to focus on in the insert.

Write in full sentences.
One point per line.
Keep it simple with the explicit **evidence**

4. Question 2

Read the question and highlight the key words to ensure you understand what the focus of your answer will be.

Read the section of text the question asks you to focus on.

Highlight key quotations which will help you answer the focus of the question. Consider the use of different language devices e.g. adjectives, similes, colour connotations, personification and metaphors

The writer uses language to describe...
'...' and '...'
This suggests...
The word '...' is effective to the reader because...
However, the word '...' could be suggesting... this is effective to the reader as...

5. Question 3

Read the question and highlight the key words. This question is about how the text is put together and organised, rather than the language devices used.

Look for the introduction of character/setting, zooming in, mood/atmosphere, shifts in focus and circular structure and highlight this.

At the beginning/middle/end of the extract, the writer uses...
'...' and '...'
This suggests...
This is effective at interesting a reader because...

6. Question 4

Read the question and highlight the key words, including the section of the text if specified. Think carefully about how far you agree with the statement.

Usually it is best to AGREE with the statement. But consider how far you agree. Is there evidence to argue against this opinion? Create a debate in your answer.

Read through and highlight words/phrases/language devices you will use to argue FOR, and maybe against the statement.

I agree/disagree with the statement that...
Firstly, the writer uses...
'...' and '...'
This suggests...
In particular, the word '...' makes a reader feel...
In addition, the use of the word '...' is effective to the reader as...

6. Writing to Describe or Narrate

Paragraph 1 - Weather
Paragraph 2 - Introduction of character
Paragraph 3 - Zooming in on the detail
Paragraph 4 - One sentence paragraph
Paragraph 5 - Weather

Think about what powerful vocabulary you could include.
Vary your sentence openers with verbs, adverbs, prepositions and adjectives.
Use a semi colon instead of because.
Include a comma after your use of a subordinate clause.
Vary your use of language devices.
Include a range of sentence forms.
Link your paragraph ideas together.

7. Writing Tips

Tip	Example
Use an adverb	Suddenly,
Use the five senses	State what you can see, hear, smell, taste or touch
Describe a setting	The room was...
Open with sounds	Boom! Crash!
Use a flashback	The memories flooded back as I...
Create mystery by hinting at what could be there	In the distance was...
Use a question	Why did Grant feel so angry?
Describe how the character is feeling	Frustrated and fed up with waiting.
Use a list of three	Cold, lonely and frightened,

8. Punctuation checklist

Full stops, commas, capital letters, apostrophes, colons, semi-colons, dashes, brackets, exclamation marks and question marks

Language Paper 2

1. The Paper	
Q1 4 marks	Find 4 true statements (5 mins)
Q2 8 marks	Summary of similarities or differences (15 mins)
Q3 12 marks	How does the writer use language to describe? (15 mins)
Q4 16 marks	Comparing writers' viewpoints and opinions (25 mins)
Q5 40 marks	Writing to present a viewpoint (45 mins inc. planning time and checking time)
2. Pre Exam Tips	
Read the blurb given for each text. Highlight key words which given you a clue about what you will be reading e.g. topic, time period.	
Read the sources carefully. Take time to make sure you understand it and highlight as you go.	

3. Question 1
Read the question and highlight the key words, including the lines it asks you to focus on.
Draw a line down the side of the lines you need to focus on in the insert.
Do not colour the box in until you are absolutely certain that you have got them correct.

4. Question 2
Read the question and highlight the key words. What differences does it what you to focus on?
Highlight key quotations which answer the question. Are there any clear similarities or differences between the two sources? Try to match up the quotes to allow you to make the best inferences.
In Source A, ... This suggests... [Connective], in Source B, ... This suggests... The similarity/difference is ...

5. Question 3
Read the question carefully. Which source are you asked to focus on and which lines?
Highlight the key words in the question so you know what to focus your answer on. As you read the relevant section of text. Highlight and label key words/phrases/devices
The writer uses language to describe... '...' and '...' This suggests... The word '...' is effective to the reader because... However, the word '...' could be suggesting... this is effective to the reader as ...

6. Question 4
Read the question carefully and highlight the key words. You know you are analysing the different opinions, but their opinions of what? Identify this. Highlight and label the different opinions they have on the topic you have been asked about. Select your evidence carefully: consider interesting language or structural devices used to get their message across.
In Source A, the writer seems to feel positive/negative about ... The writer uses (insert language feature) to describe... ... This suggests... The word '...' is effective to the reader because... However, the word '...' could be suggesting... this is effective to the reader as ... [connective], in Source B, the writer seems to feel positive/negative about ... The writer uses (insert language feature) to describe... ... This suggests... The word '...' is effective to the reader because... However, the word '...' could be suggesting... this is effective to the reader as ...

7. Presenting A Viewpoint
Signal Format Intro - what we already know - Topic triple Topic 1 - Imagine. Imagine this: Topic 2 - Another issue/reason (so, so, so or more, more sentence) Topic 3 climax - Perhaps the most important ... (Fortunately/Unfortunately) Conclusion - Reference the future (For future generations it is vital that)
Think about what powerful vocabulary you could include in your response. Vary your sentence openers with a range of sentence types. Use a semi colon instead of because. Include a comma after your use of a subordinate clause. Vary your use of language devices. Include a range of sentence forms.

8. Paragraph Focus Hints
Health Time Money Social Environment

9. Writing Tips	
Tip	Example
Imagine. Imagine this:	Imagine. Imagine this: Steph is a hardworking Y11 student who is taking 8 GCSEs.
The so, so, so sentence	Exams are so important. So makes sure you're revising so that you pass your exams.
The more, more, more sentence	More revision will mean more opportunity which will mean more money!
The it isn't, it is sentence	It isn't rocket science, it is common sense.
The fortunately; unfortunately sentence	Fortunately most students are revising; unfortunately a few are not.
Reference to the future	Tomorrow's world needs... For future generations it is vital that

10. Punctuation checklist
Full stops, commas, capital letters, apostrophes, colons, semi-colons, dashes, brackets, exclamation marks and question marks

Language Paper 1 Question 3 - How does the writer use structure to interest you as the reader?

8 marks

Annotate the extract and find evidence for:

- **Introduction of setting**
- **Introduction of character**
- **Zooming in**
- **Dialogue.**

This extract is from a novel entitled *Private Peaceful*, set in 1914 during WWI. In this extract the narrator, a 15-year-old soldier, tells us about a gas attack.

We were lulled by the blue skies perhaps, or by sheer boredom. Fritz seemed to have gone to sleep on us and as far as we were concerned that suited us fine. We thought we could go to sleep too. The awakening came suddenly. "Gas! Gas!"

The cry goes up and is echoed all along the trench. For a moment we are frozen with panic. We have trained for this time and again, but nonetheless we fumble clumsily, feverishly with our gas masks.

"Fix bayonets!" Hanley's yelling while we're still trying frantically to pull on our gas masks. We grab our rifles and fix bayonets. We're on the firestep looking out into no-man's-land, and we see it rolling towards us, this dreaded killer cloud we have heard so much about but have never seen

for ourselves until now. Its deadly tendrils are searching ahead, feeling their way forward in long yellow wisps, scenting me, searching for me. Then finding me out, the gas turns and drifts straight for me. I'm shouting inside my gas mask. "Christ! Christ!" Still the gas comes on, through our wire, swallowing everything in its path.

I hear again in my head the instructor's voice, see him shouting at me through his mask when we went out on our last exercise. "You're panicking in there, Peaceful. A gas mask is like God, son.

It'll work bloody miracles for you, but you've got to believe in it." But I don't believe in it! I don't believe in miracles.

The gas is only feet away now. In a moment it will be on me, around me, in me. I crouch down, hiding my face between my knees, hands over my helmet, praying it will float over my head, over the top of the trench, seek out someone else. But it does not. It's all around me. I tell myself I will

not breathe, I must not breathe. Through a yellow mist I see the trench filling up with it. It drifts into the dugouts, snaking into every nook and cranny, looking for me. I see men running, staggering, falling. I see Pete shouting out for me. Then he's grabbing me and we run. Half-blinded by my mask I trip and fall, crashing my head against the trench wall, knocking myself half-senseless. My gas mask has come off. I pull it down, but I have breathed in and know already it's too late. My eyes are stinging. My lungs are burning. I am coughing, retching, choking. I don't care where I'm running so long as it is away from the gas. At last I'm in the

reserve trench and it is clear of gas. I'm out of it. I wrench off my mask, gasping for good air.

Then I am on my hands and knees, vomiting violently.

Answer the question - How does the writer use structure to interest you as the reader?
8 marks

Dotted lines for writing.

Tier 2 Vocabulary

Stench – a strong, very unpleasant smell

Abundance – A large quantity of something

Startling – very surprising or causing a moment of fright

**Brain dump all that you could describe from the image.
Use as many descriptive features as you can.**



Annotate the sample answer for the descriptive features

The sun was an angry shade of red and the sky above cloudless. Not a single bird was in the sky. He wasn't surprised. His ears still rang from the booming bombardment that had continued until the early hours of the morning. His eyes followed the jagged line of the trench, it had rained in the night, and the smell of the stinking corpses crept up his nostrils. Coughing violently he felt the bitter taste of gunpowder on his lips.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

1. Analysis of Unseen Poem	
Title	Why is the title of the poem effective?
Speaker	Who is the speaker of the poem and why is this effective?
Language	What words or phrases can you analyse from the poem?
Structure	What structural points can you analyse from the poem?
Form	What is the form of the poem and why do you think the writer chose this?
Rhyme	Is there a rhyme scheme to the poem? What might this rhyme scheme represent?

2. Comparing the poems	
Title	How are the titles similar of different? Why is this effective to the reader?
Speaker	Who is speaking in each of the poems? Why is this effective to the reader?
Language	What words or phrases can you analyse from the poem? What is the language feature that the writer has used? Are the language features similar of different?
Structure	What the structural feature that the writer has used? Are the structural features similar of different?
Form	What are the forms of the poems? Are the forms similar of different?
Rhyme Scheme	Do the poems have a rhyme scheme? Are they similar of different? Why?

5. Adding Connectives - to build on what has already been stated	In addition
	Also
	And
	Similarly
	Moreover
	Furthermore
	Additionally

4. Forms of Poetry	
Sonnet	A short rhyming poem with 14 lines. Sonnets use iambic meter in each line, and use line-ending rhymes.
Narrative Poem	Tell the story of events. There are clear narration, characters and plot.
Free Verse	Does not follow any rules
Ballad	A long poem in short stanzas normally quatrains (4 lines) that tells a story. They often use repetition.
Elegy	A poem of serious reflection, normally about the dead.

5. Language Features	
Metaphor	Comparing one thing to another
Simile	Comparing two things with 'like' or 'as'
Personification	Giving human qualities to the nonhuman
Imagery	Language that makes us imagine a sight
Senses	Sights, sounds, smells, tastes, feelings
Pathetic Fallacy	Using weather to create a mood
Irony	Language that says one thing but implies the opposite
Colloquial	Informal language, usually creates a conversational tone or authentic voice
Onomatopoeia	Language that sounds like its meaning
Alliteration	Words that are close together start with the same letter or sound
Sibilance	The repetition of s or sh sounds
Assonance	The repetition of similar vowel sounds
Consonance	The repetition of consonant sounds
Assurance	The repetition of similar vowel sounds
Plosives	short burst of sound: t, k, p, d, g, or b sound

6. Structural Features	
Stanza	A verse, or group of lines in a poem
Repetition	Repeated words or phrases
Enjambment	A sentence or phrase that runs onto the next line
Caesura	Using punctuation to create pauses or stops.
Contrast	Opposite concepts/feelings in a poem.
Juxtaposition	Placing two elements together in order to examine or compare them. This is usually done in order to determine their contrast, differences, or similarities.
Oxymoron	Two terms with contradictory meanings are placed together
Anaphora	The first word of a stanza is the same across different stanza
Volta	A turning point in a poem
Speaker	The narrator, or person in the poem.
Couplet	A pair of rhyming lines next to each other
Sonnet	Poem of 14 lines with clear rhyme scheme
Monologue	One person speaking for a long period of time.

7. Contrasting Connectives - Go against what has already been stated.	But
	However
	In contrast
	On the other hand
	Nevertheless
	Unlike
	Yet

Language Paper 2 Question 27.1 - In 'First Frost' how does the poet present the speaker's feelings towards love? 24 marks

Annotate the extract and find evidence to prove how the speaker feels.

Remember to annotate for:

- **Title**
- **Speaker**
- **Language**
- **Structure**
- **Tone**

First Frost

A girl is freezing in a telephone booth,
huddled in her flimsy coat,
her face stained by tears
and smeared with lipstick.

She breathes on her thin little fingers.
Fingers like ice. Glass beads in her ears.

She has to beat her way back alone
down the icy street.

First frost. A beginning of losses.
The first frost of telephone phrases.

It is the start of winter glittering on her cheek,
the first frost of having been hurt.

Andrei Vosnesensky

This image shows a full page of white paper with horizontal dashed lines, typical of primary school writing paper. The lines are evenly spaced and run across the entire width of the page. There are no margins, text, or other markings present.

Language Paper 2 Question 27.1 - In 'First Frost' how does the poet present the speakers feelings about the weather? 24 marks

Annotate the extract and find evidence to prove how the speaker feels.

Remember to annotate for:

- **Title**
- **Speaker**
- **Language**
- **Structure**
- **Tone**

Hard Frost

Frost called to the water Halt
And crusted the moist snow with sparkling salt;
Brooks, their one bridges, stop,
And icicles in long stalactites drop.
And tench in water-holes
Lurk under gluey glass like fish in bowls.

In the hard-rutted lane
At every footstep breaks a brittle pane,
And tinkling trees ice-bound,
Changed into weeping willows, sweep the ground;
Dead boughs take root in ponds
And ferns on windows shoot their ghostly fronds.

But vainly the fierce frost
Interns poor fish, ranks trees in an armed host,
Hangs daggers from house-eaves
And on the windows ferny ambush weaves;
In the long war grown warmer
The sun will strike him dead and strip his armour.

Andrew J Young

[illegible]

Maths

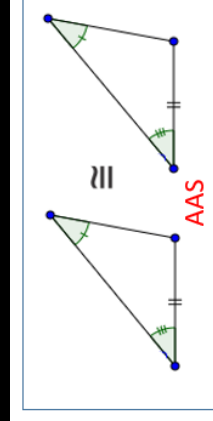
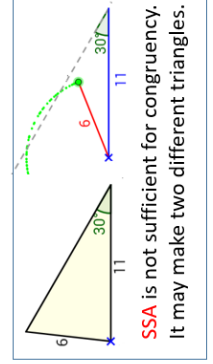
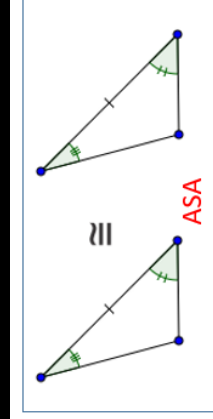
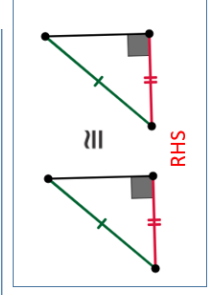
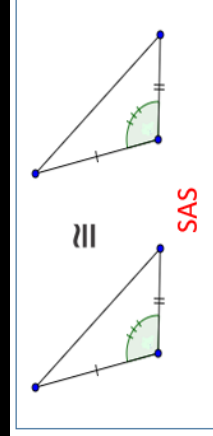
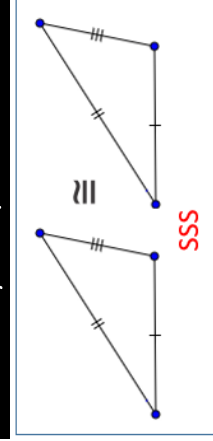
Mathematics: Year 10 Term 1

Remedy 1: Congruency, Similarity and Enlargement

Section 1 Key words/terms:

Enlarge	Makes a shape bigger or smaller all in the same proportion.
Scale factor	How many times bigger or smaller.
Origin	This is at the point (0,0).
Fractional scale factor	A type of scale factor. If you have a scale factor $\frac{1}{2}$ your shape/object would divide your side lengths by two in size. A scale factor $\frac{1}{3}$ would divide your side lengths by three in size.
Centre of enlargement	The point in which you enlarge from.
Ratio	The relationship in quantity, amount, or size between two or more things.
Similar	Similar shapes are enlargements of each other using a scale factor. All the corresponding angles in the similar shapes are equal and the corresponding lengths are in the same ratio.
Parallel	Lying or moving in the same direction but always the same distance apart.
Parallel Lines	(The arrow on each line indicates the two lines are parallel).
Congruent	Congruent shapes are shapes that are exactly the same.

Section 3 Key words/terms:



Section 2 Key words/terms:

A typical exam question

Describe fully the single transformation that maps shape P onto shape Q (3 marks)

When describing you must mention 3 things:

- 1) It's an enlargement.
- 2) The scale factors.
- 3) The centre of enlargement.

Corresponding sides

Corresponding angles

Calculating the scale factor:

Compare two corresponding sides and divide the biggest by the smallest to find the scale factor.

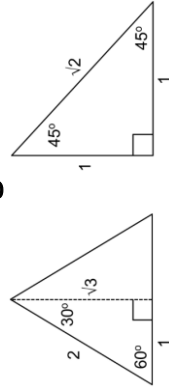
How to find the centre of enlargement:

Draw lines joining the corners of the shapes. Continue the lines until they cross at a point. This is the centre of enlargement.

Section 4 Key words/terms:	
Hypotenuse	Is the longest side of a right-angled triangle, the side opposite the right angle.
Adjacent side	The adjacent side is the non-hypotenuse side that is next to a given angle.
Opposite side	The one across from a given angle.
Right angle	Angles that are exactly 90 degrees.
Rearrange	Change (the position, time, or order of something).
Inverse	The operation that reverses the effect of another operation.
θ (Theta)	The Greek letter θ (theta) is used to represent a measured angle.
Prism	A prism shape is a 3D shape which has a constant cross-section (Both ends have the same 2D shape).
Midpoint	Midpoint refers to a point that is in the middle of the line joining two points.
Square-based pyramid	A pyramid is a shape that has a base and triangular sides. The triangular sides are all the same shape and size. This pyramid has a square base and four.
Diagonal	A diagonal is a line connecting the opposite vertices (corners) of a polygon.

Section 5 Key words/terms:

Exact trig values:



	0°	30°	45°	60°	90°
$\sin(\theta)$	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
$\cos(\theta)$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
$\tan(\theta)$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	Undefined

Section 6 Key words/terms: (Higher Only)	
Negative scale factor	A type of scale factor. With a negative scale factor produces an image on the other side of the centre of enlargement.
Length scale factor	How much bigger a length is compared to a smaller one.
Area scale factor	To calculate the area scale factor, square the length scale factor. You can then use this to determine the area of a similar shape.
Volume scale Factor	To calculate the volume scale factor, cube the length scale factor. You can then use this to determine the area of a similar shape.

Section 7 Key words/terms: (Higher Only)

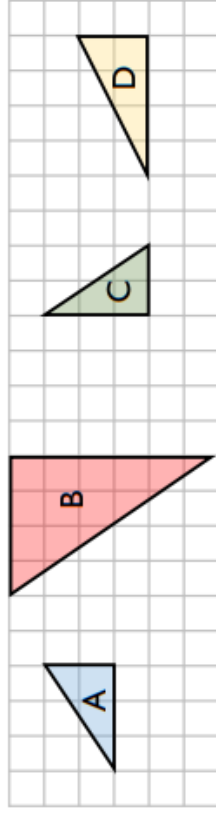
Formula	For finding sides	For finding angles
Sine Rule	$\frac{a}{\sin(A)} = \frac{b}{\sin(B)} = \frac{c}{\sin(C)}$	$\frac{\sin(A)}{a} = \frac{\sin(B)}{b} = \frac{\sin(C)}{c}$
A picture guide to help show representation of letters for sine and cosine rule		
Cosine Rule	$a^2 = b^2 + c^2 - 2bc \cos(A)$	
	$\cos(A) = \frac{b^2 + c^2 - a^2}{2bc}$	

When do you use the sine or cosine rule?

What you are given:	What you want to know:	What to use:
Two side and the angle opposite one of the sides	The angle opposite the other side	Sine rule
Two angles and the side opposite one of the angles	The side opposite the other angle	Sine rule
Two sides and the angle between them	The third side	Cosine rule
All three sides	Any angle	Cosine rule

Foundation

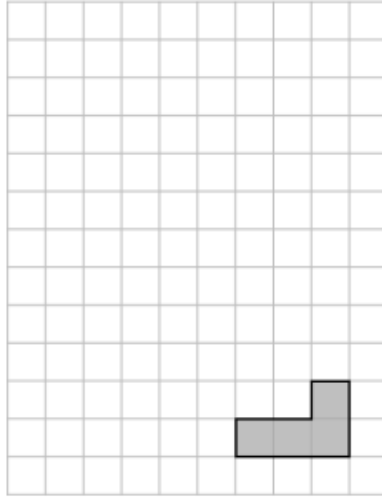
1 Complete the sentences



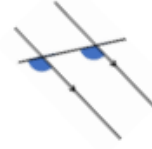
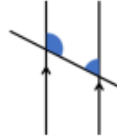
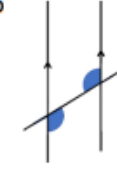
Triangle A is congruent to triangle _____

Triangle A is similar to triangle _____

2 Enlarge the shape by scale factor 2



3 Match the diagram to the name.



Alternate angles

Corresponding angles

Co-interior angles

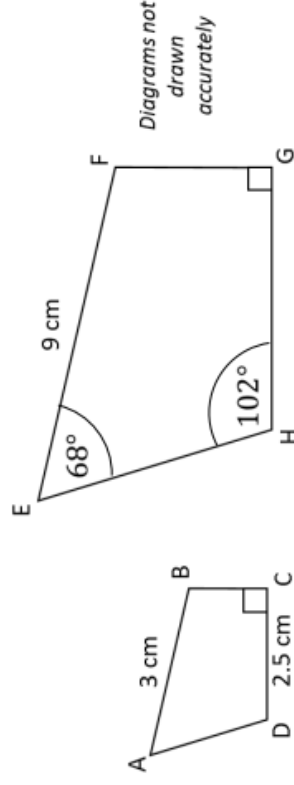
4 When a shape is enlarged, it always becomes bigger. Tick whether this statement is true or false.

True ☐

False ☐

Give a reason for your answer.

5 The two shapes ABCD and EFGH are similar.



a) Work out the size of angle EFG.

b) What is the size of angle ADC?

c) Work out the scale factor of the enlargement from ABCD to EFGH.

d) Work out the length HG.

6

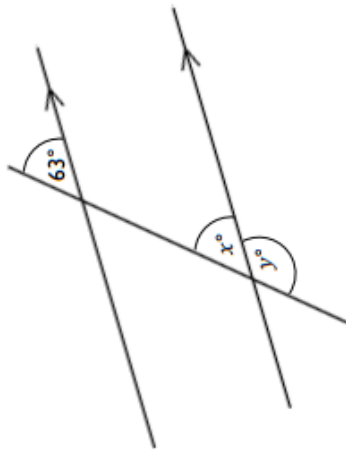


Diagram
not drawn
accurately

a) Work out the size of angle x

Give a reason for your answer.

b) Work out the size of angle y

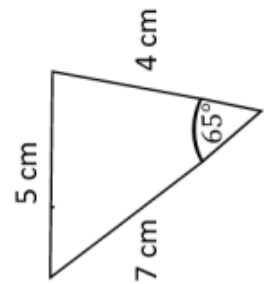
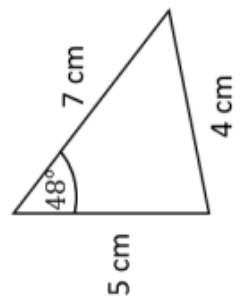
Give a reason for your answer.

$x =$ _____

$y =$ _____

7

Here are two congruent triangles.
State the condition that shows that they are congruent.



8

Work out the size of angle x .

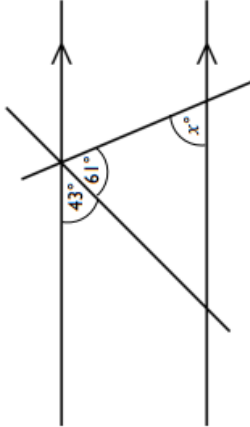


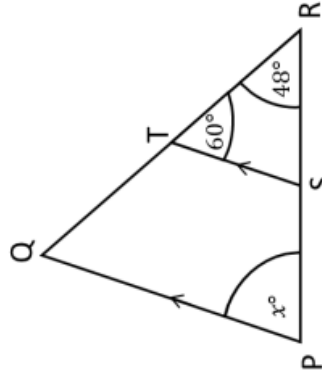
Diagram
not drawn
accurately

$x =$ _____

9

The two triangles PQR and STR are similar.

Diagram
not drawn
accurately



a) What is the size of angle x ?

$x =$ _____

The scale factor of the enlargement of PQR to STR is $\frac{1}{3}$
b) If QR is 24 cm, what is the length of TR?

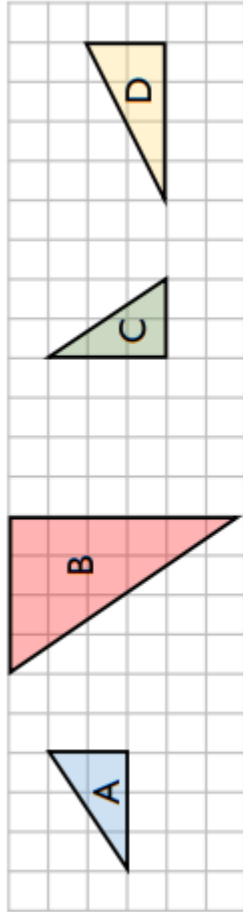
_____ cm

c) If SR is 7 cm, what is the length PS?

_____ cm

Higher

- 1 Complete the sentences



Triangle A is congruent to triangle _____

Triangle A is similar to triangle _____

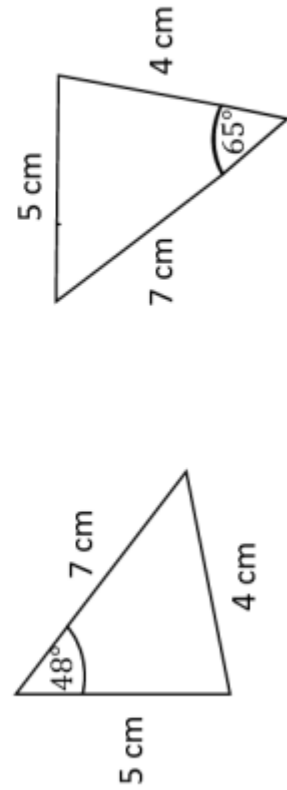
- 2 When a shape is enlarged, it always becomes bigger.
Tick whether this statement is true or false.

True ☐

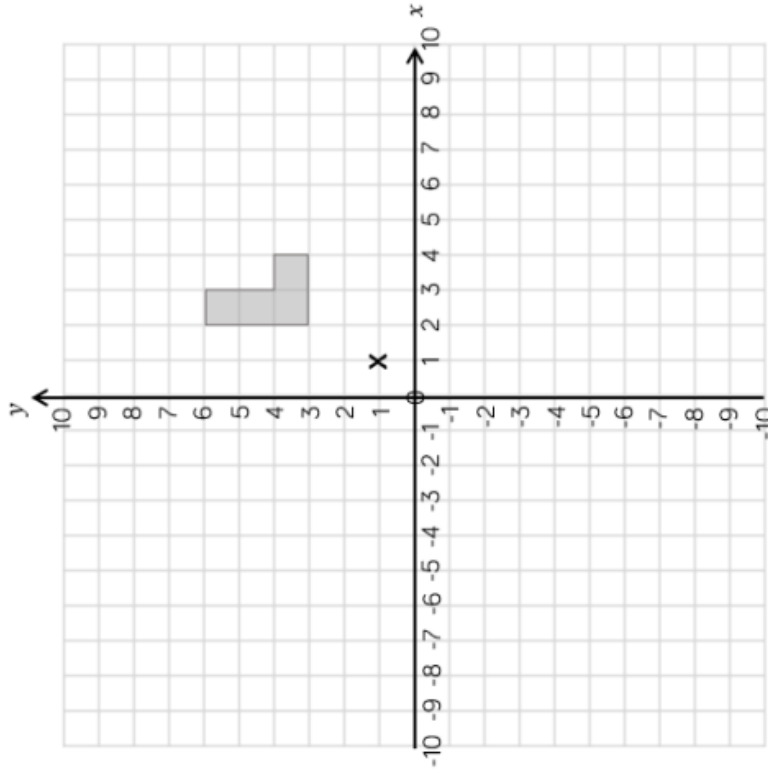
False ☐

Give a reason for your answer.

- 3 Here are two congruent triangles.
State the condition that shows that they are congruent.

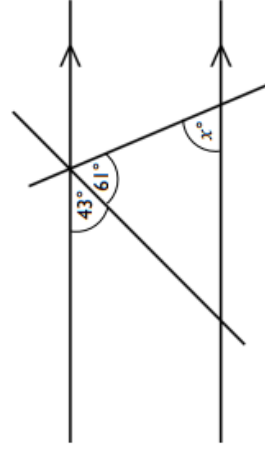


- 4 Enlarge the shape by a scale factor of -2 with centre of enlargement (1, 1)

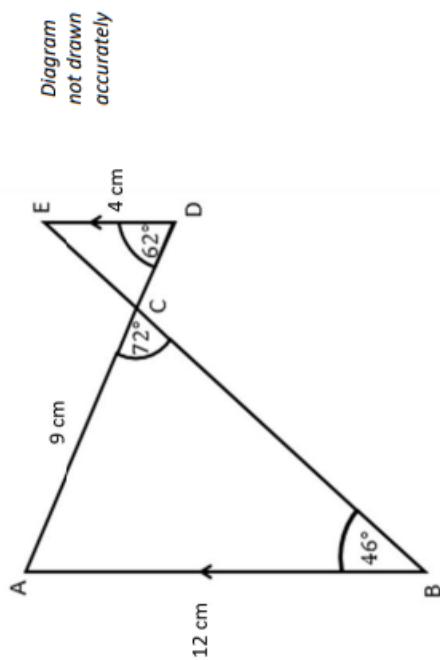


- 5 Work out the size of angle x .

Diagram
not drawn
accurately



6



a) Prove that triangle ABC and triangle DEC are similar.

b) Find the length CD.

_____ cm

7

A triangular prism has a volume of 100 cm^3

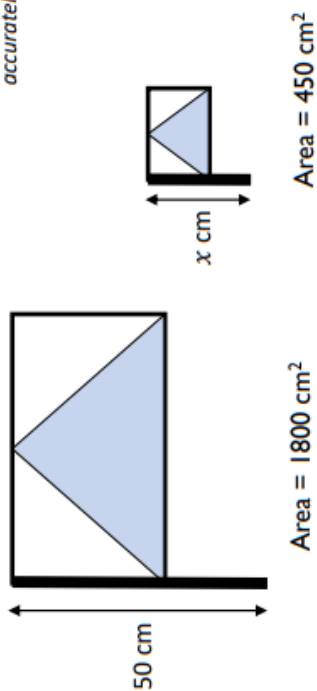
Work out the volume of a triangular prism whose sides are three times as long as this one.

_____ cm^3

8

The two flags are similar.

Diagram not drawn accurately

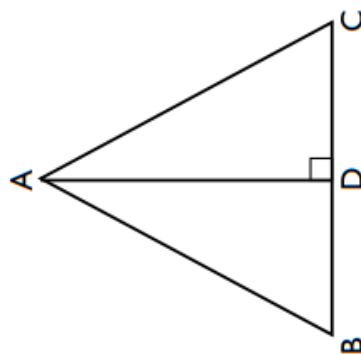


If the length of the original flagpole is 50 cm, what is the value of x ?

9

$x =$ _____ cm

Diagram not drawn accurately



ABC is an equilateral triangle.
Prove that triangle ADC is congruent to triangle ADB.

Mathematics: Year 10 Term 2

Remedy 2: Representing Solutions of Equations and Inequalities

Section 1 Solving Equations	
Solution	A value for a variable which makes an equation true.
Variable	A symbol for a value we don't know yet. It is usually a letter like x or y.
Solve	Inverting the operations to find the value of the unknown.
Equation	Says that two things are equal.
Expression	A mathematical statement containing a minimum of two numbers or variables and at least one maths operation.
Inverse	The opposite or reverse of.
Balance	When both sides have the same quantity.
Value	A number or result of a calculation.
Unknown	A value that we do not know which is represented by a letter.

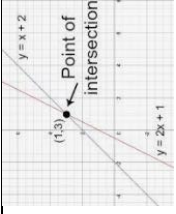
Section 2 Inequalities	
Inequality	Compares two values, showing if one is less than, greater than, or simply not equal to another value.
Solution Set	All the values of the variable which make the inequality true.
Greater/Less than (or equal to)	
Number line	

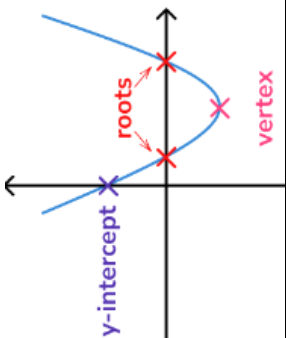
Set Notation	Collection of items with one of each member. The members of a set are called elements.
Union	The union of sets A and B is the set of elements in A or B, or both.
Intersection	The intersection of two sets has only the elements common to both sets.
Set Notation	
{ }	A set
U	Union
∩	Intersection
∈	An element of

Section 3 Linear Graphs	
Gradient	How steep a line is.
Linear	The difference between the values is the same.
y-intercept	The point where a line or curve crosses the y axis of a graph.
Co-ordinate	A set of values that show an exact position.
Plot	To draw on a graph or map.
Intersect	To cross over (have some common point).
Solve graphically	Using a graph to find the value(s) of an unknown.
Solve algebraically	Using algebra to find the value(s).

Section 4 Graphical Inequalities	
Satisfy	A value(s) that solve an equation.
Region	The area above or below the graph that satisfies the inequality.
Dashed line	The values that satisfy the inequality are above or below the value.
Solid line	The values that satisfy the inequality can include the value.
Test point	The coordinate that you use to decide if the solutions satisfy the inequality.

Section 7 Simultaneous Equations	
Subject of the formula	The variable that is on its own one side of the equals sign.
Simultaneous Equations	Two or more equations which share variables
Rearrange	Using inverse operations changing the position of terms.
Meet	Point at which the line cross.
Negative	A value less than zero.
Subtract	To take one number away from another.
Eliminate	To remove a variable.
Equivalent	Having the same value.
Co-efficient	A value used to multiply a variable Coefficient Variable Operator Constants $4x - 7 = 5$
Multiplier	The number you are multiplying by
Lowest Common Multiple	The smallest positive number that is a multiple of two or more numbers
Formulate	A rule or fact written in mathematical symbols.

Section 8 Simultaneous Equations	
Curve	A smoothly flowing line, no sharp changes.
Square	A value multiplied by itself.
Intersection	The point where two lines or a line and an axis meet.
	
Non-linear	The difference between the values is not the same.
Rearrange	Using inverse operations changing the position of terms.
Simplest form	Collect together like terms
In terms of	Answer is written with the included variable.

Section 5 Quadratics	
Quadratic	Where the highest power of the variable is squared (²).
this makes it Quadratic $5x^2 + 3x + 3 = 0$	
Roots	The solutions of a quadratic equation.
y-intercept	The point where a line or curve crosses the y axis of a graph.
	
Factorise	Finding what to multiply to get an expression.
Brackets	Symbols used in pairs to group things together.
x-axis	The line on a graph that runs horizontally through zero.
x-Intercept	The point where a line or curve crosses the x axis of a graph.
Sketch	Producing a rough idea of the overall shape of the graph with key details.

Section 6 Algebra	
Possible	Values that satisfy the given equation.
Infinite	Without an end
Finite	A value that can be measured, has an end.
Variables	A symbol for a value we don't know yet. It is usually a letter like x or y.
Equation	Says that two things are equal.
Substitute	Replacing variables with another value
Verify	Making sure a solution is correct by making sure it satisfies all equations.
Solution	A value for a variable which makes an equation true.
Solve	Inverting the operations to find the value of the unknown.
Unknown	A value that we do not know which is represented by a letter.
Inverse	+ ↔ × ↔ ÷

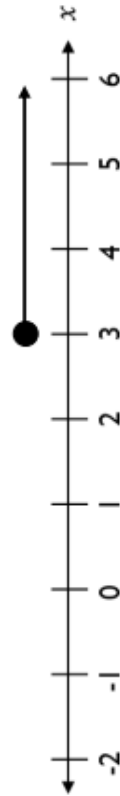
Foundation

1 Solve

a) $5x + 12 = 42$

b) $38 < 4x - 10$

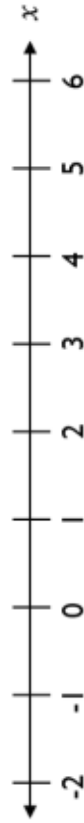
2 a) Write, in terms of x , the inequality shown by each number line.



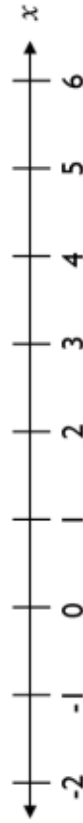


b) Show the inequalities on each number line.

$x < 3$



$1 \leq x < 5$



3 Kat thinks of a number.

She doubles it and then subtracts 5
Her answer is greater than 50

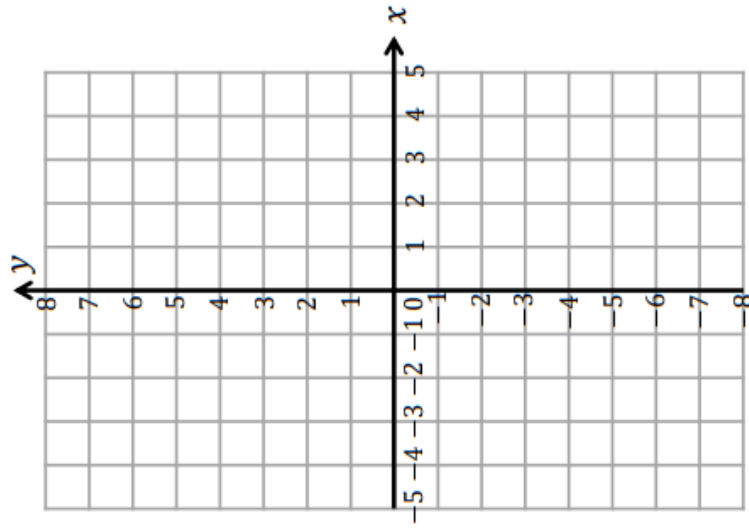
a) Write this information as an inequality, using n to represent Kat's number.

b) What is the smallest possible integer that Kat could be thinking of?

- 4 a) Complete the table of values for $y = 3x - 2$

x	-2	-1	0	1	2	3
y			-2		4	

- b) On the grid, draw the graphs of $y = 3x - 2$ and $y = 7$

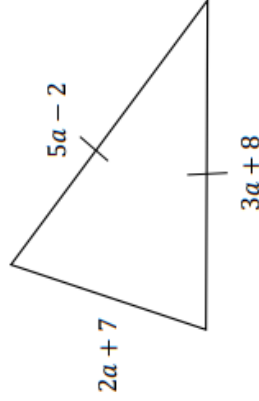


- c) Use the graphs to solve $3x - 2 = 7$

- 5 Solve the inequality

$$5x + 17 < 2x + 23$$

- 6 The diagram shows the lengths of the sides of a triangle in terms of a .



- a) Explain why $3a + 8 = 5a - 2$

- b) Solve the equation $3a + 8 = 5a - 2$

- c) Work out the length of the shortest side of the triangle.

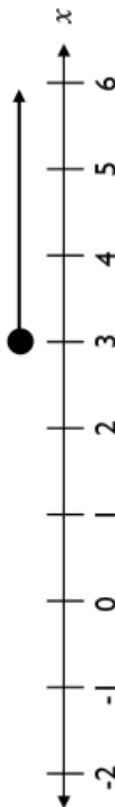
Higher

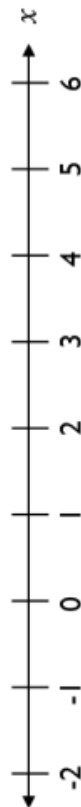
1 Solve

a) $12 + 5x = 42$

b) $38 < 4x - 10$

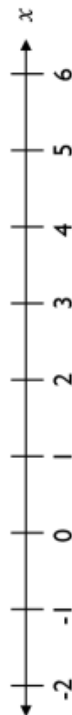
2 Write, in terms of x , the inequality shown by each number line.



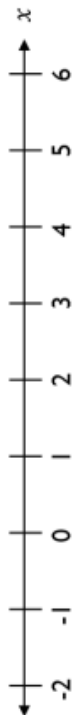


3 Solve the inequalities.
Show the solutions on the number line.

a) $x + 4 > 3$



b) $-1 \leq 2x + 1 < 7$



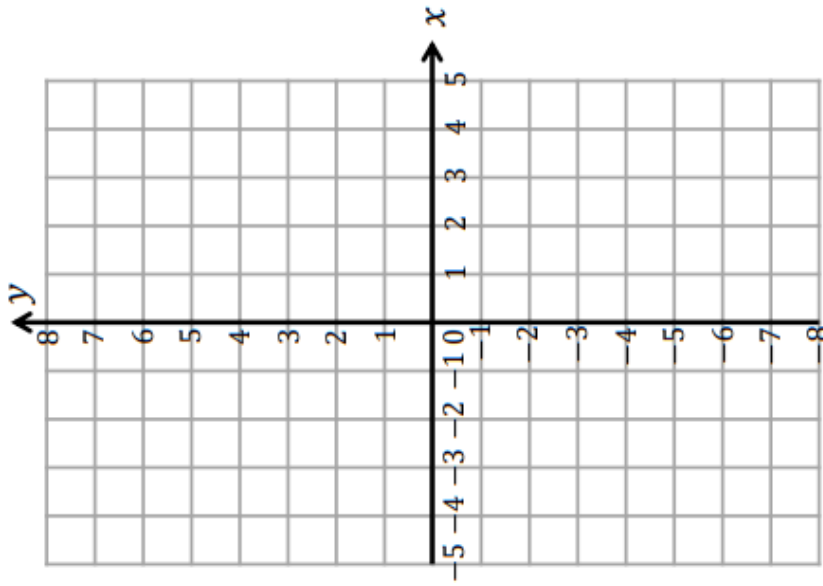
4 Electrician A charges a fixed fee of £45 plus £20 per hour.
Electrician B charges a fixed fee of £20 plus £25 per hour.

Form and solve an inequality to find after how many hours electrician B is more expensive than electrician A.

- 5 a) Shade the region that is satisfied by both of the inequalities.

$$x > -1$$

$$x + 4 \geq y$$



- b) Circle the points that would lie within this region.

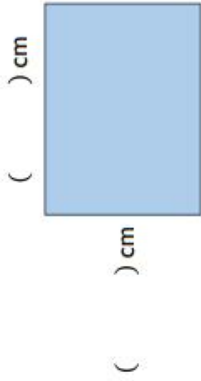
$(-1, 3)$

$(1, 5)$

$(3, -10)$

- 6 The rectangle below has an area of $(x^2 + 5x + 6) \text{ cm}^2$

- a) Factorise the quadratic to find an expression for each of the lengths.



- b) If the area of the rectangle is 42 cm^2 , find the value of x

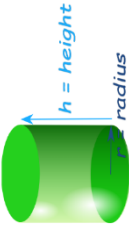
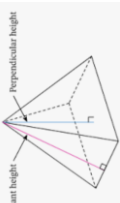
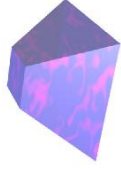
- 7 Sketch the graph of $y = x^2 + 3x - 4$

$$\text{Solve } x^2 + 3x - 4 < 0$$

Mathematics: Year 10 Term 3

Remedy 3: Working with Circles

Section 1 Angles and Compass Points	
Cardinal directions	North, east, south, and west are the four cardinal directions, often marked by the initials N, E, S, and W.
Compass	An instrument that shows direction (such as North, South, East and West) by a small magnetic needle that points North/South.
Point	An exact location. It has no size, only position.
Angle	The amount of turn between two lines around their common point (the vertex).

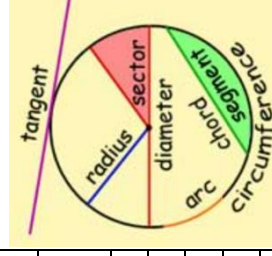
Section 3 Cylinder, Cone, Pyramid and Sphere	
Cylinder	A solid object with two identical flat ends that are circular (or more generally have a curved boundary) and one curved side. It has the same cross-section from one end to the other. 
Cone	A solid (3-dimensional) object that has a circular base joined to a point by a curved side. 
Perpendicular Height	The height measured at 90° from the base to the vertex at the top 
Frustum	Usually, a pyramid or cone with the top cut off flat. But can be any part of a solid between two parallel planes 
Sphere	A 3-dimensional object shaped like a ball. Every point on the surface is the same distance from the centre.
Hemisphere	In geometry it is an exact half of a sphere.

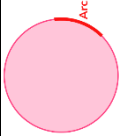
Section 2 Understand and Represent Bearings

Three figure bearing	The angle in degrees measured clockwise from North ensuring it always three numbers It is common to put extra "0"s to make it a full 3 digits, so: - North is 000° - East is 090° - South is 180° - West is 270°
North Line	Line indicating North bearing
Clockwise	Moving in the direction of the hands on a clock.
Bearing	A Compass Bearing tells us Direction
Bearing of... from...	Direction relative from one point to another

Section 4 Parts of Circle

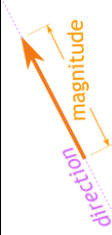
Radius	The distance from the centre to the circumference of a circle.
Diameter	The distance from one point on a circle through the centre to another point on the circle. It is twice the radius.
Chord	A line segment connecting two points on a curve.
Centre	The middle of the circle.
Tangent	A line that just touches a curve at a point.
Arc	Part of the circumference of a circle.
Sector	A "pie-slice" part of a circle.
Segment	The smallest part of a circle made when it is cut by a line.



Section 5 Calculate with Circles	
Circumference	The distance around the edge of a circle. Circumference = $\pi \times \text{Diameter}$
Circle Area	The area of a circle is π times the radius squared. $A = \pi r^2$
Subtended	The angle made by something from a given viewpoint.
Major Arc	A major arc is greater than half the circumference.
Minor Arc	A minor arc is less than half the circumference.
Arc Length	 $\text{Arc length} = \frac{\theta}{360} \times \pi \times d$ $\theta - \text{angle of the sector}$ $d - \text{diameter of the circle}$
Minor Sector	Minor sector: a minor sector has a central angle which is less than 180° .
Major Sector	Major sector: a major sector has a central angle which is more than 180° .
Area of a sector	 $\text{Arc length} = \frac{\theta}{360} \times \pi \times d$ $\theta - \text{angle of the sector}$ $d - \text{diameter of the circle}$

Section 6 Surface Area	
Surface area	The total area of the surface of a three-dimensional object
In terms of π	It means you don't include a numerical approximation for π in your answer, you just leave π as π .
Curved surface	Curved outside layer surface
Slant height	the shortest distance from the apex traveling the face of the object to the base.

Section 7 Understand and Represent Vectors	
Vector	describes a movement from one point to another
Column vector	is a way of writing a vector which gives information about the vector. It is split into a horizontal component and a vertical component
Direction	Where something is pointing
Scalar	A number on its own used when dealing with vectors
Size	How big something is
Magnitude	The size of something

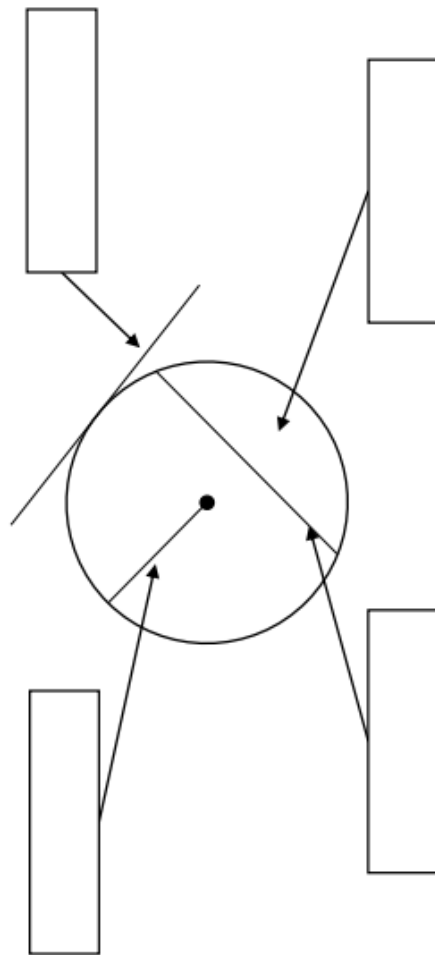


Section 7 Draw and Understand Vectors Multiplied by Scalar	
Multiplier	A number that you are multiplying by
Parallel	Lines on a plane that never meet. They are always the same distance apart. 
Resultant	When we add two vectors, the final vector is called the resultant and is noted by a lowercase r 
Collinear	When three or more points lie on a straight line

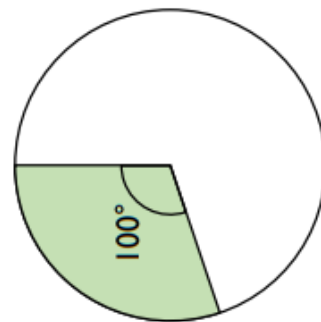
Foundation

- 1 Label the parts of the circle using the words in the box.
You will not need to use all the words.

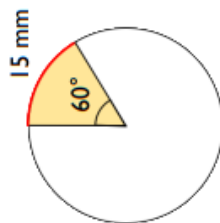
Tangent	Sector	Segment
Radius	Diameter	Chord



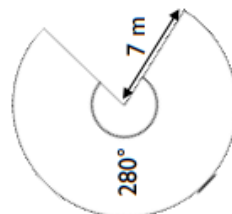
- 2 What fraction of the circle is shaded?
Give your answer in its simplest form.



- 3 The arc length shown is 15 mm.
Find the circumference of the circle.



4



Which calculation works out the area of the sector? Circle your answer.

$$\frac{280}{360} \times \pi \times 7^2$$

$$\frac{80}{360} \times \pi \times 7^2$$

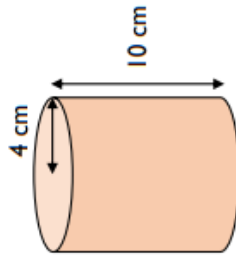
$$\frac{280}{360} \times \pi \times 14^2$$

$$\frac{80}{360} \times \pi \times 14^2$$

Hence, calculate the area of the sector.

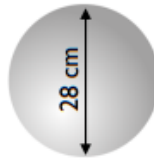
_____ m²

- 5 Calculate the volume of the cylinder.



_____ cm³

- 6 A sphere has a diameter of 28 cm.



Volume of a sphere = $\frac{4}{3}\pi r^3$

Surface area of a sphere = $4\pi r^2$

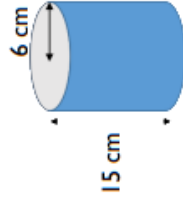
Calculate the surface area of the sphere.
Give your answer to 3 significant figures.

_____ cm²

Calculate the volume of the sphere.
Give your answer in terms of π .

_____ cm³

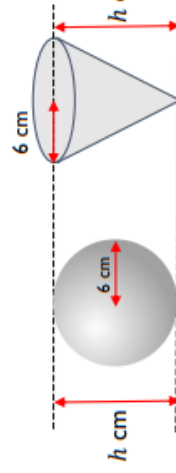
- 7 A soup company makes tin cans as shown in the diagram.



A label is made to cover the curved surface of the cylinder.
What area does the label cover?

_____ cm²

- 8 The diagram shows a sphere and a cone.
They have the same radius of 6 cm and the same height h cm.



Volume of sphere = $\frac{4}{3}\pi r^3$

Volume of cone = $\frac{1}{3}\pi r^2 h$

Explain why $h = 12$ cm.

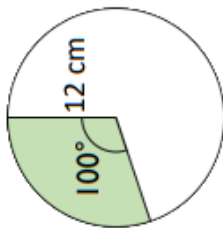
Work out the volume of the sphere and the cone.
Give your answers in terms of π .

Volume of the sphere = _____ cm³

Volume of the cone = _____ cm³

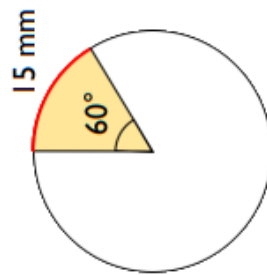
Higher

- 1 What fraction of the circle is shaded?
Give your answer in its simplest form.

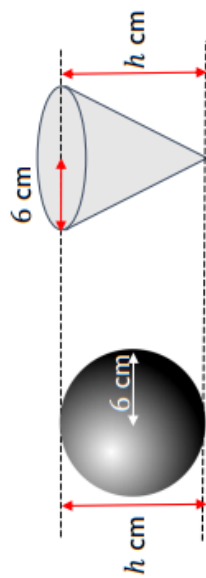


Calculate the area of the shaded sector.

- 2 The arc length shown is 15 mm.
Find the circumference of the circle.



- 3 A sphere and a cone each have radius 6 cm.



$$\text{Volume of sphere} = \frac{4}{3}\pi r^3$$

$$\text{Volume of cone} = \frac{1}{3}\pi r^2 h$$

Show that the volume of the sphere is exactly twice the volume of the cone.

- 4 A, B and C are points on the circumference of a circle, centre O.



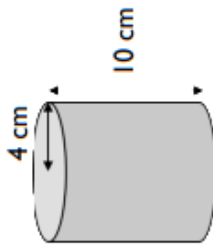
$$\text{Angle BAC} = 63^\circ$$

Work out the size of angle ACB.

Give reasons for each stage of your working.

- 5 A soup company sells cans.

The dimensions are shown in the diagram.



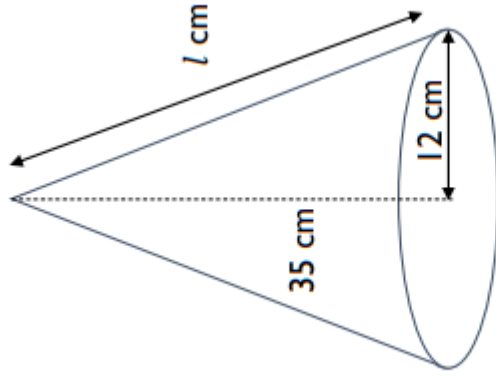
Show that the volume of the can is $160\pi \text{ cm}^3$

The same company sells a larger can of soup that is mathematically similar to the can shown.

The height of the larger can is 15 cm.

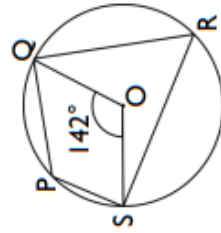
What is the volume of the larger can of soup?

- 7 A cone has a base radius of 12 cm and a vertical height of 35 cm.



Given that the curved surface area of cone is given by the formula $A = \pi r l$, calculate the total surface area of the cone.

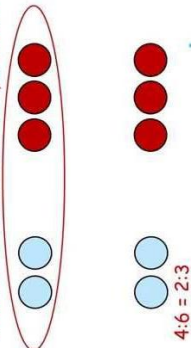
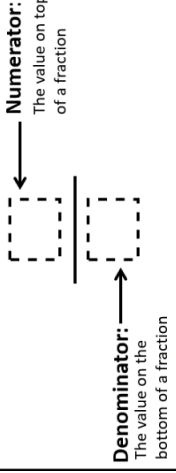
- 6 P, Q, R and S are points on the circumference of a circle, centre O.



$$\angle SOQ = 142^\circ$$

Work out the size of $\angle SPQ$.

Give reasons for each stage of your working.

Section 1		
Ratio*	Compares a number of parts of a whole to the total of all parts.	2 : 3 
Simplify/in simplest form*	Dividing by a common factor.	Write the ratio 4:6 in its simplest form. 
Equivalent*	Having the same value.	e.g. these ratios are equivalent 2:3 = 4:6 = 6:8
Units*	Used to measure e.g. cm, grams etc.	
Convert/Conversion*	Process of changing or causing something to change from one form to another.	e.g. converting a measurement from grams to kilograms by dividing by 1000.
Share	Divide between a number of parts	
Fraction*	A fraction is a part of a whole. In order to be a fraction each part must be equal in size.	A Fraction is a way of displaying a non-integer number as a division 
Proportion*	Two ratios or fractions that are of equal value.	
Section 2		
Direct proportion*	The ratio of one to the other remains the same.	
Origin*	As one increases the other increases at the same rate.	
Equation*	The point with the coordinates (0,0).	
	An equation says that two things are equal.	e.g. $4x + 6 = 26$
Integer*	Whole number	Non-integer Not a whole number

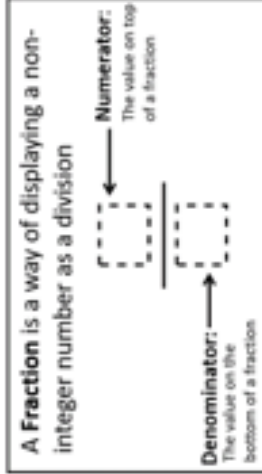
Section 2 continued		
Gradient*	How steep a slope (line) is. It is calculated by dividing the change in the y direction by the change in the x. The gradient represents how many more/less of the y variable for every 1 more of the x variable.	
$y = mx + c$	The coefficient of x (the number in front of x) tells us the gradient of the line $y = mx + c$ ← The value of c is the point at which the line crosses the y-axis: Y intercept y and x are coordinates e.g. $y = 3x - 2$ $m = 3$, the gradient is 3 and $c = -2$, the y intercept is -2.	
Exchange rate*	Changing currencies between countries. This is different between different currencies.	
Map Scale*	The distance on a map is in proportion with the distance in real life.	
Bearing*	A 3-digit angle, measured from North, used to tell us a direction or position.	e.g. if an object was East from another you would travel on a bearing of 090° to get to it.
Section 3		
Best value	Which is the cheapest for the same amount?	
Unit cost	Cost for one item.	
Lowest Common Multiple (LCM)	The lowest quantity that is a multiple of two or more given quantities.	e.g. 12 is the LCM of 2, 3, and 4.
Variable*	A quantity that can take a range of values.	
Enlarge*	Makes a shape bigger or smaller, the shape remains in the same proportion. All lengths are multiplied by the same scale factor.	
Length scale factor*	How much you multiply lengths by to enlarge a shape. If the length scale factor is a fraction the shape will get smaller.	
Area Scale factor	The length scale factor squared.	
Volume scale factor	The length scale factor cubed.	
Similar*	If a shape has been enlarged the object and the image are similar.	

Mathematics: Year 10 Term 4 100% sheet

Percentages and Interest

Section 4

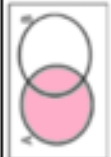
Percentage*	An amount per hundred, used to describe proportion.	
Decimal*	A number that consists of a fractional part, written as tenths, hundredths, thousandths etc. Decimal numbers lie between integers on a number line.	
Fraction*	A fraction is a part of a whole. In order to be a fraction each part must be equal in size.	
Numerator*	The number on the top of the fraction.	
Denominator*	The number on the bottom of the fraction.	
Vinculum*	The horizontal line in between the numerator and denominator in a fraction.	
Conversion/Convert*	Process of changing or causing something to change from one form to another.	
Equivalent*	Having the same value.	e.g. $\frac{1}{2} = 0.5 = 50\%$
Multiplier*	The decimal you multiply by to perform a percentage calculation.	
Reduce/decrease*	Make smaller	Increase/growth* Make larger
Depreciate	If an item depreciates it is worth less.	
Express*	Write	e.g. express 5 out of 10 as a percentage means write 5 out of 10 as a percentage

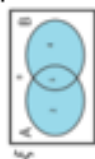


Section 5

Interest*	A fee paid for borrowing money or saving money. Usually calculated as a percentage of the money borrowed/saved.	
Simple Interest	An estimate for calculating interest. The amount for year 1 is calculated and then multiplied by the number of years invested. Simple Interest James invests £2000 at 5% simple interest. The original value increases by this amount every year	
Compound Interest*	Interest is paid on the total amount in the account at the given time. How interest is calculated in real life. Compound Interest Tess invests £100 at 10% compound interest for 3 years	
Repeated percentage change	Compound Interest Tess invests £100 at 10% compound interest for 3 years	
Power/Index/exponent	e.g. 1.12^3 the 3 is the power/index/exponent	
Original*	The initial value (at the start).	
Reverse*	Calculating a missing value.	
Decay	The process of reducing an amount by a consistent percentage rate over a period of time.	
Iterate	the repeated application of a function or process in which the output of each step is used as the input for the next iteration.	
Subscript	The n and n+1 here are written in subscript	U_n – a term U_{n+1} – the next term
Geometric	A sequence where each term is found by multiplying the previous one by a fixed non-zero number.	

Section 6		
Fraction*	The probability of an outcome can be given as a fraction.	Number of desired event Number of outcomes
Exact value	To write a number without the need for rounding.	e.g. $10n$ is an exact value, 314.16 (2 dp) is a rounded value.
Lowest Common Multiple (LCM)*	The lowest quantity that is a multiple of two or more given quantities.	e.g. 12 is the LCM of 2, 3, and 4.
Simplest form	To simplify by writing as one operation rather than multiple operations.	

Section 7		
Equally likely	Each outcome of an experiment occurs with equal probability	e.g. getting a tail or a head on an unbiased coin are equally likely outcomes as the probability of each is 0.5
Event/ Outcome	A possible result of an experiment or trial.	
Venn Diagram	A visual representation of the differences and similarities between two sets. Elements around the outside are in neither set.	
Complement	A set of elements in the universal set that is not part of the original set. The probability of an outcome and its complement sum to 1 (they either happen or don't).	
 in set A $P(A)$	 NOT in set A $P(A')$	
Universal set	A set which contains all objects, including itself.	e.g. a venn diagram representing which students study Art and French, the universal set is all the students.

Section 7 continued.		
Intersect (intersection)	The overlap of a venn diagram. The elements in set A AND B.	 in set A AND set B $P(A \cap B)$
Union	The combination of 2 sets, all the elements in the two sets. The elements in set A OR B.	 in set A OR set B $P(A \cup B)$
Set	A collection of different things; a set contains elements.	

Section 8																							
Relative frequency	The number of times an event happens divided by the total number of outcomes that took place in an experiment, known as the number of trials. Gets closer to the expected probability the more trials are carried out.																						
Expectation/ Expected value	Calculated by multiplying the probability of the outcome by the number of trials.																						
Estimate	An approximate value.																						
Two-way tables	are a way of sorting data so that the frequency of each category can be seen quickly and easily.																						
		<table><tr><th></th><th>Car</th><th>Bus</th><th>Walk</th><th>Total</th></tr><tr><th>Year 9</th><td>10</td><td>8</td><td>6</td><td>24</td></tr><tr><th>Year 10</th><td>6</td><td>7</td><td>5</td><td>18</td></tr><tr><th>Total</th><td>16</td><td>15</td><td>11</td><td>42</td></tr></table>		Car	Bus	Walk	Total	Year 9	10	8	6	24	Year 10	6	7	5	18	Total	16	15	11	42	
	Car	Bus	Walk	Total																			
Year 9	10	8	6	24																			
Year 10	6	7	5	18																			
Total	16	15	11	42																			
Frequency table	Constructed by arranging collected data values in ascending order of magnitude with their corresponding frequencies (how many of each there are).																						
Sample space	Lists all possible outcomes and can be written in set notation or displayed in a table.	Set notation: Sample space is denoted by the letter S , and can be written in set notation $\{ \}$ $S = \{HH, HT, TH, TT\}$	<table><tr><td></td><td>H</td><td>T</td></tr><tr><td>H</td><td>HH</td><td>HT</td></tr><tr><td>T</td><td>TH</td><td>TT</td></tr></table>		H	T	H	HH	HT	T	TH	TT											
	H	T																					
H	HH	HT																					
T	TH	TT																					
Systematic	To have a pattern or order to the way you work																						
Array	An arrangement of objects, pictures, or numbers in rows and columns.																						

Section 9

Independent events	Two events are independent if the occurrence of one event does not affect the chances of the occurrence of the other event.	e.g. the probability of it rolling a 5 on the first roll of a die and the probability of rolling a 5 on the second roll of a die are independent events.
Product	Multiply	e.g. the product of 5 and 2 is 10
At least one	One or more	e.g. the probability of getting at least one tail when flipping 2 coins includes the outcomes TH, HT AND TT.
Dependent events	Events which depend upon what happened before.	e.g. the probability of being late may be dependent on the weather.
Conditional probability	Events where the likelihood of it occurring is based on the occurrence of a previous event.	e.g. the probability of getting a second red sweet after the first sweet is taken and <i>not replaced</i> is conditional.
Given that	A condition that is met first and narrows the focus.	e.g. the probability a student studies French <i>given that</i> they study Art. The denominator is the number of students that study Art.
And Rule	The probability of either event A and event B occurring is found by multiplying the probability of event A and the probability of event B, as long as both events are mutually exclusive.	
Or rule	The probability of either event A or event B occurring is found by adding the probability of event A and the probability of event B, as long as both events are mutually exclusive.	
	$P(A \text{ or } B) = P(A) + P(B)$	

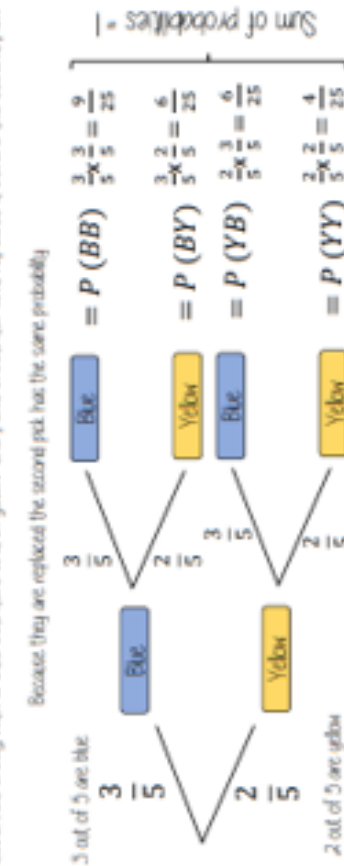
Section 10

Tree diagram

- A way of representing a sequence of events.
- Records all possible outcomes clearly.
- The probabilities are written on the branches.
- The probabilities on each set of branches have a sum of one.
- The probability of the outcomes can be found by multiplying along the branches (and rule).
- If more than one outcome is wanted the final probabilities can be added (or rule).

Tree diagram for independent event

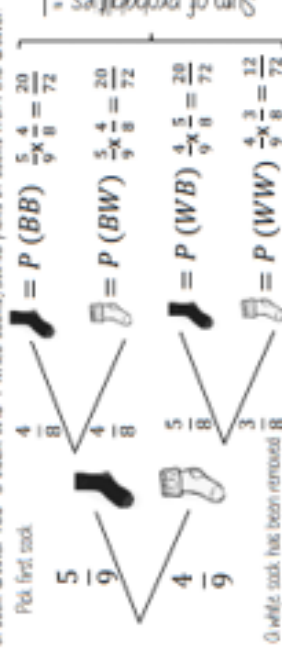
Label has a bag with 3 blue counters and 2 yellow. She picks a counter and replaces it before the second pick.



Tree diagram for dependent event

event

0 sock drawer has 5 black and 4 white socks, Jamie picks 2 socks from the drawer.



NOTE: as 'socks' are removed from the drawer the number of socks in that drawer is also reduced - the denominator is also reduced for the second pick.

Foundation

- 1 Use $<$, $>$ or $=$ to make each statement correct.

$$76\% \quad \bigcirc \quad \frac{3}{4}$$

$$1.5 \quad \bigcirc \quad 1\frac{1}{5}$$

$$0.025 \quad \bigcirc \quad 23\%$$

- 2 Work out 23% of 540

- 3 Raymond earns £872 a month.
In March, he also receives a 12% bonus.
Calculate his total salary in March.

£ _____

- 4 There is 500 ml of tea in a teapot.
Alex pours 275 ml of the tea into a cup.

What percentage of the tea has Alex poured into the cup?

- 5 Tia deposits £500 into a savings account.
The savings account pays 2.8% simple interest per year.
How much will she have in the account after 3 years?

£ _____

- 6 Dexter is saving for a new bike.
He has saved 80% of the cost of the bike so far.
He has saved £480
Calculate the cost of the bike.

£ _____

7 Jemima invests £15 000 for 5 years at 4.5% per annum compound interest.
How much interest does she earn?

£ _____

8 A kitten weighs 120 grams when it is born.
The kitten's weight increases by 11% every day for the first week after it is born.
Joe says the kitten will more than double in weight during the first week.

Is Joe correct?
Show working to justify your answer.

9 Annie, Tommy and Jack share some marbles.
Annie gets 25% of the marbles.
Jack gets $\frac{3}{5}$ of the marbles.

Show that the ratio of Annie's marbles : Jack's marbles : Tommy's marbles is
5 : 12 : 3

Tommy says that they shared 45 marbles.
Explain why this can not be true.

Higher

- 1 Raymond earns £872 a month.
In March, he also receives a 12% bonus.
Calculate his total salary in March.

£ _____

- 2 There is 1 litre of tea in a teapot.
Alex pours 275 ml of the tea into a cup.

What percentage of the tea has Alex poured into the cup?

- 3 Becca and Tia both invest £5000 into savings accounts.
Becca's account earns 4.5% simple interest per annum.
Tia's account earns 4% compound interest per annum.
Which account will have more money after 5 years?
Show working to justify your answer.

- 4 Dexter is cycling to his friend's house.

After 1 hour and 45 minutes, he has completed 70% of his journey.
Assuming he continues at the same speed, what is his total journey time?

hours

minutes

- 5** A kitten weighs 120 grams when it is born.
 The kitten's weight increases by 11% every day for the first week after it is born.
 Joe says the kitten will more than double in weight during the first week.
 Is Joe correct?
 Show working to justify your answer.

- 7** A sequence is given by the rule $u_1 = 1$, $u_{n+1} = 4u_n$
 Find u_2 , u_3 and u_4

$$u_2 = \text{---}, u_3 = \text{---}, u_4 = \text{---}$$

- 6** Annie, Tommy and Jack share some marbles.
 Annie gets 25% of the marbles.
 Jack gets $\frac{3}{5}$ of the marbles.
 Show that the ratio of Annie's marbles : Jack's marbles : Tommy's marbles is
 5 : 12 : 3

Rosie says that you can find u_6 by doubling u_3
 Is Rosie correct?
 Show working to justify your answer.

Tommy says that they shared 45 marbles.
 Explain why this can not be true.

Mathematics: Year 10 Term 5

Remedy 5: Non-calculator Methods

Section 1	
Population	The whole group that is being studied.
Sample	A selection taken from a larger group (the "population").
Biased	A systematic (built-in) error which makes all values wrong by a certain amount.
Random	Happening by chance. Not able to be predicted.
Stratified	Used to select a sample that is representative of different groups. If the groups are of different sizes, the number of items selected from each group will be proportional to the number of items in that group.
Primary Data	Information collected by the researcher.
Secondary Data	Information collected by someone else other than the researcher.
Section 2	
Frequency Polygon	A graph made by joining the middle-top points of the columns of a frequency histogram.
Midpoint	The middle of. The point halfway along.
Endpoint	Any of the two furthest points on a line segment.
Frequency	How often something happens.
Class Interval	The range of each group of data.
Sector	A "pie-slice" part of a circle - the area between two radii and the connecting arc of a circle.
Section 3	
Mean	The Arithmetic Mean is the average of the numbers: a calculated "central" value of a set of numbers. To calculate it: • add up all the numbers, • then divide by how many numbers there are.
Median	The "middle" of a sorted list of numbers.
Mode	The number which appears most often in a set of numbers.
Outlier	A value that "lies outside" (is much smaller or larger than) most of the other values in a set of data.

Section 4	
Trend line	A line on a graph showing the general direction that a group of points seem to follow.
Stem and leaf	A plot where each data value is split into a "leaf" (usually the last digit) and a "stem" (the other digits).
Range	The difference between the lowest and highest values.
Cumulative	The total of all frequencies so far in a frequency distribution. It is the 'running total' of frequencies.
Quartiles	The values that divide a list of numbers into quarters.
Lower Quartile	The value under which 25% of the data can be found.
Upper Quartile	The value under which 75% of the data can be found.
Interquartile range	Upper quartile subtract lower quartile.
Correlation	Two sets of data that are strongly linked together.
Positive correlation	Correlation is Positive when the values increase together
Negative correlation	Correlation is Negative when one value decreases as the other increases
Line of best fit	A line on a graph showing the general direction that a group of points seem to follow.
Interpolation	Estimating a value inside a set of data points.
Extrapolation	Estimating a value outside a set of data points.

Section 5			
Balance	The ending cash total appearing on the bank statement for a bank account.		
Profit	Income minus all expenses. If a balance is in profit, it is positive.		
Loss	When expenses are greater than income a loss is incurred. If a balance is in loss, it is negative.		
Credit	An amount received.	Debit	An amount owed.
Perimeter	The distance around a 2D shape		
Area	The space inside a 2D shape.		
Volume	The space inside a 3D shape		
Fraction	A way of representing a non-integer number as a division		
Numerator	The top number in a fraction.		
Denominator	The bottom number in a fraction.		
Reciprocal	What you multiply a number by to make 1.		
Mixed number	A whole number and a fraction	e.g. $2\frac{1}{3}$ is a mixed number	
Improper fraction	A fraction greater than one. Where the numerator is greater than the denominator.	e.g. $\frac{5}{3}$ is an improper fraction	
Section 6			
Exact values	Not rounded, given in its most accurate form e.g. 3π or $\sqrt{5}$		
In terms of	Including e.g. the circumference of a circle with a diameter of 5 in terms of pi is 5π .		
Square root	The inverse of squaring	$\sqrt{\quad}$ Cube root	The inverse of cubing $\sqrt[3]{\quad}$
Sine	Is the ratio of the side opposite the angle and the hypotenuse in a right-angled triangle.		$\text{Sin}\theta = \frac{\text{Opposite}}{\text{Hypotenuse}}$
Cosine	Is the ratio of the side adjacent to the angle and the hypotenuse in a right-angled triangle.		$\text{Cos}\theta = \frac{\text{Adjacent}}{\text{Hypotenuse}}$
Tangent	Is the ratio of the side opposite the angle and the side adjacent to the angle in a right-angled triangle.		$\text{Tan}\theta = \frac{\text{Opposite}}{\text{Adjacent}}$
Integer	A whole number.		
Terminating	A terminating decimal has a finite number of decimal places.		
Infinite	Without end, continues forever.		

Section 6 continued	
Rational	A number that can be written as a fraction.
Irrational	A number that cannot be written as a fraction.
Surd	An irrational number expressed as a square root.
Factor	A number that divides into another number with no remainder.
Rationalise	To eliminate the irrational number in the denominator.
Section 7	
Degree of accuracy	Given criteria for rounding a number, how accurate to give it.
Approximate	Roughly equal to. A number can be approximated by rounding.
Significant figure	The most significant figure is the digit that has the highest place value.
Limit	Cut off point.
Error Interval	Shows the margin of error when a number has been rounded. Given as an inequality e.g. $5.25 \leq x < 5.35$
Upper/Lower Bound	The largest/smallest value a number could have taken before it was rounded.
Truncate	To cut off a number, to find an estimate for the number without rounding.
Correct to...	The degree of accuracy a number has been rounded to.
Section 8	
Compensate	A way of adding or taking away numbers that you find easier
Factorise	Write as a product of factors.
VAT	Value Added Tax.
Standing order/charge	An agreed monthly outgoing.
Allowance	A sum of money allotted or granted for a particular purpose.
Tax	Money paid directly to the government.
Force	Pushes and pulls in a particular direction
Pressure	Force per unit area $\text{Pressure} = \frac{\text{Force}}{\text{Area}}$
Density	Density is a measure of how much matter is in a certain volume.
Mass	The weight of a body

Foundation

1 Work out

$$0.3 \times 20$$

$$\frac{5}{6} \text{ of } 300$$

2 A pizza costs £3.79

Work out the cost of 24 pizzas.

3 Work out an estimate for the value of $\frac{43 \times 28}{0.52}$

4 Calculate

$$\frac{5}{9} - \frac{1}{2}$$

$$\frac{2}{3} \div \frac{2}{5}$$

£

- 5 A small town has a population of 6000 people to the nearest thousand. What are the least and greatest possible values for the size of the population?

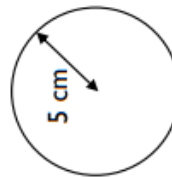
Least = _____

Greatest = _____

A book is 19 cm long, correct to the nearest centimetre. Complete the error interval for the length l of the book

_____ $\leq l <$ _____

- 6 Work out the area of the circle. Give your answer in terms of π



- 7 Annie needs to make 35 cheese sandwiches. In each sandwich, she uses 25 g of cheese. Each block of cheese is 300 g. How many blocks of cheese does she need to buy altogether?

- 8 A family buy tickets for two adults and three children to enter a theme park. They have a 20% discount voucher. After using the voucher, they pay £54.40. The original price of a child's ticket is £11. What is the original price of an adult's ticket?

£ _____

Higher

- 1 A pizza costs £3.79
Work out the cost of 24 pizzas.

- 2 Calculate

$$\frac{5}{9} - \frac{1}{2}$$

$$\frac{2}{3} \div \frac{2}{5}$$

- 3 Work out an estimate for the value of $\frac{43 \times 28}{0.52}$

£ _____

- 4 A family buy tickets for two adults and three children to enter a theme park.
They have a 20% discount voucher.
After using the voucher, they pay £54.40
The original price of a child's ticket is £11
What is the original price of an adult's ticket?

£ _____

£ _____

- 5 Write $\frac{6}{\sqrt{3}}$ in the form $a\sqrt{b}$ where a and b are integers.

- 7 Annie and Tommy both draw a circle.
Annie's circle has a radius of 5 cm to the nearest centimetre.
Tommy's circle has a radius of 7 cm to the nearest centimetre.

What is the maximum difference in length of circumferences of the two circles?
Give your answer in terms of π

- 6 The area of the rectangle can be written in the form $a + b\sqrt{3}$
Work out the value of a and b .

$$3 + 2\sqrt{3}$$



$$2 + \sqrt{3}$$

- 8 Prove algebraically that the recurring decimal $0.3\dot{5}$ can be written as $\frac{16}{45}$

$$a = \underline{\hspace{2cm}}$$

$$b = \underline{\hspace{2cm}}$$

Science

Mastering Microscopy

Cells range in size:

- animal cells are between 0.01 mm – 0.05 mm
- plant cells are between 0.01 mm – 0.10 mm

The human eye can see objects as small as around 0.05 mm. A microscope is required to see cells in any detail.

Microscopes magnify the image of a biological specimen so that it appears larger.

There are two main types of microscope: light microscopes are used to study living cells and for regular use when relatively low magnification and resolution is enough. Electron microscopes provide higher magnifications and higher resolution images but cannot be used to view living cells.



LIGHT MICROSCOPE

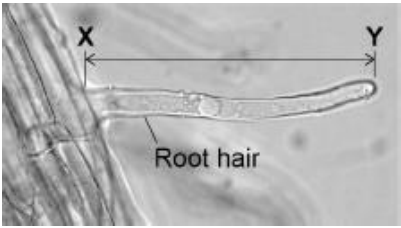


ELECTRON MICROSCOPE

TASK - Use your own knowledge, the internet, and the images above to complete the table to give the similarities and differences between light microscopes and electron microscopes.

Light microscopes	Electron microscope

Q1. **Figure 1** shows a root hair viewed using a microscope.



(a) The root hair was viewed at a magnification of $\times 50$

The image length of the root hair **X-Y** is 43 mm

Calculate the real length of the root hair in micrometres (μm).

Real length = _____ μm

(4)

(b) A microscope has a $\times 5$ eyepiece lens.

Describe how to use this microscope to observe a prepared slide of root hair cells at a magnification of $\times 50$

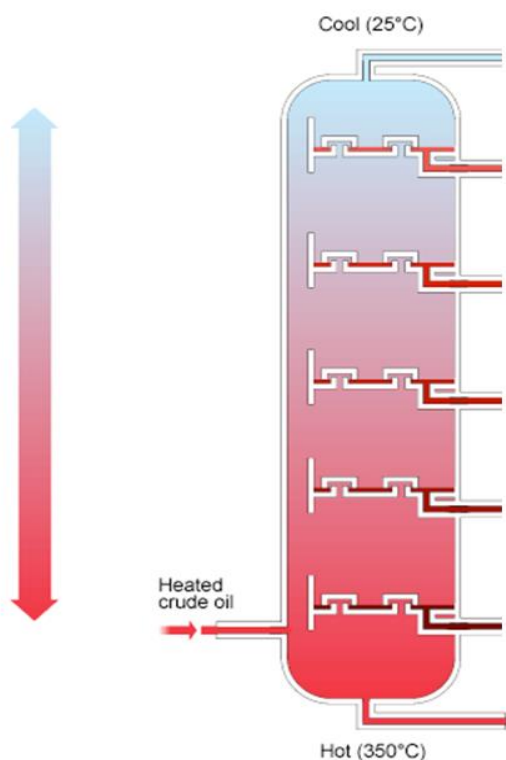
(4)

Mastering Fractional distillation

Crude oil is a finite resource. Petrol and other fuels are produced from it using fractional distillation.

Fractional distillation is used to separate crude oil into simpler, more useful mixtures. This method can be used because different hydrocarbons have different boiling points.

TASK 1 - Use your own knowledge and the internet to label the fractionating column.



TASK 2 - Use your completed diagram to explain how alkanes are separated by fractional distillation.

Q1. Diesel is a mixture of lots of different *alkanes*.

What are *alkanes*?

(2)

Q2. To make crude oil more useful it is separated into different fractions.

(a) Complete the gaps in the following sentences.

Crude oil is separated into different fractions by a process called _____
_____. Each fraction has a different _____.

(2)

(b) Each fraction is a mixture of compounds. Most of these compounds are hydrocarbons, made up of the elements hydrogen and carbon.

(i) Explain the difference between a mixture and a compound.

(2)

(ii) Explain the difference between a compound and an element.

(2)

(Total 6 marks)

Mastering Energy Resources

Every person, animal and device transfers energy. Much of that energy is supplied by electricity, which must be generated from other energy stores. Some of these are renewable but most are non-renewable.

Renewable resources are replenished either by:

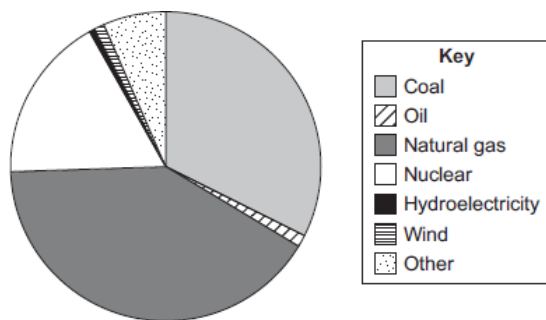
- human action - eg trees cut down for biofuel are replaced by planting new trees
- natural processes - eg water let through a dam for hydroelectricity is replaced through the water cycle

A non-renewable energy resource is one with a finite amount. It will eventually run out when all reserves have been used up.

TASK 1 - Use your own knowledge and the internet to complete the table about the different energy resources.

Energy resource	Energy store	Renewable or non-renewable	Uses	Power output	Impact on environment
Fossil fuels (oil, coal and natural gas)	Chemical				
Nuclear	Nuclear				
Biofuel	Chemical				
Wind	Kinetic				
Hydro-electricity	Gravitational potential				
Geothermal	Internal (thermal)				
Tidal	Kinetic				
Solar	Nuclear				
Wave	Kinetic				

Q1. (a) The pie chart shows how the electricity generated in the UK is produced using different energy resources.



- (i) Which energy resource is used to generate approximately one third of the UK's electricity?

(1)

- (ii) Name **two** energy resources that could be part of the 'Other' energy resources used to generate electricity in the UK.

1. _____

2. _____

(2)

- (b) A farmer plans to generate all the electricity needed on her farm, using either a biogas generator or a small wind turbine.

The biogas generator would burn methane gas. The methane gas would come from rotting the animal waste produced on the farm. When burnt, methane produces carbon dioxide.

The biogas generator would cost £18 000 to buy and install. The wind turbine would cost £25 000 to buy and install.

The average power output from the wind turbine would be the same as the continuous output from the biogas generator.

Evaluate the advantages and disadvantages of the two methods of generating electricity.

Conclude, with a reason, which system would be better for the farmer to buy and install.

(6)

Mastering Stem Cells

Stem cells in humans

Stem cells are cells that have not undergone differentiation. A cell which has not yet become specialised is called undifferentiated.

An embryo develops from a fertilised egg. Cells at the early stages in the development of the embryo are stem cells.

If cells are removed from the embryo – called embryonic stem cells – they will differentiate into any cell type.

Some stem cells remain in the bodies of adults – adult stem cells. Adult stem cells are found in limited numbers at certain locations in the body.

Adult stem cells can be found in several regions of the body, including the:

- brain
- eyes
- blood
- heart
- liver
- bone marrow
- skin
- muscle

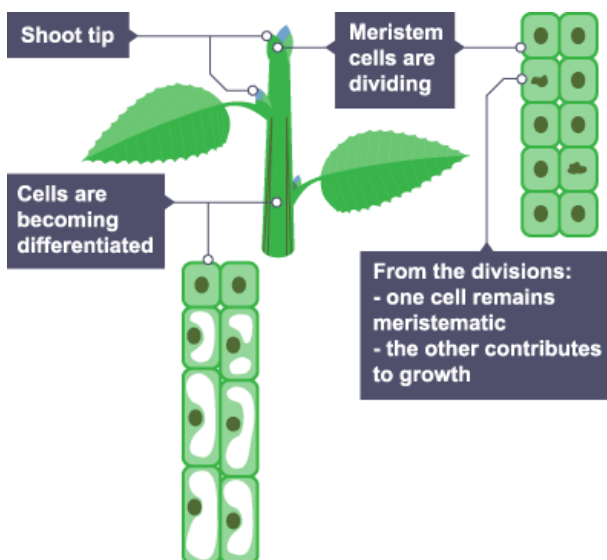
Adult stem cells can differentiate into related cell types only, for example, bone marrow cells can differentiate into blood cells and cells of the immune system but not other cell types.

Stem cells in plants

Cell division in plants occurs in regions called meristems.

Cells of the meristem can differentiate to produce all types of plant cells at any time during the life of the plant.

The main meristems are close to the tip of the shoot, and the tip of the root.



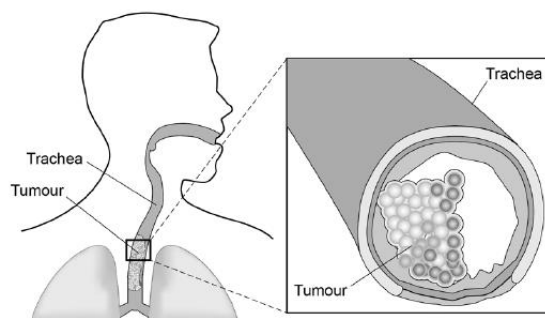
In a growing shoot, new cells are being produced continuously near the tip. As the cells become older, further away from the tip, they become differentiated – they enlarge and develop vacuoles

Q1. Stem cells can be used to treat some diseases.

(a) What is a stem cell?

(2)

Figure 1 shows a malignant tumour in the trachea of a patient.

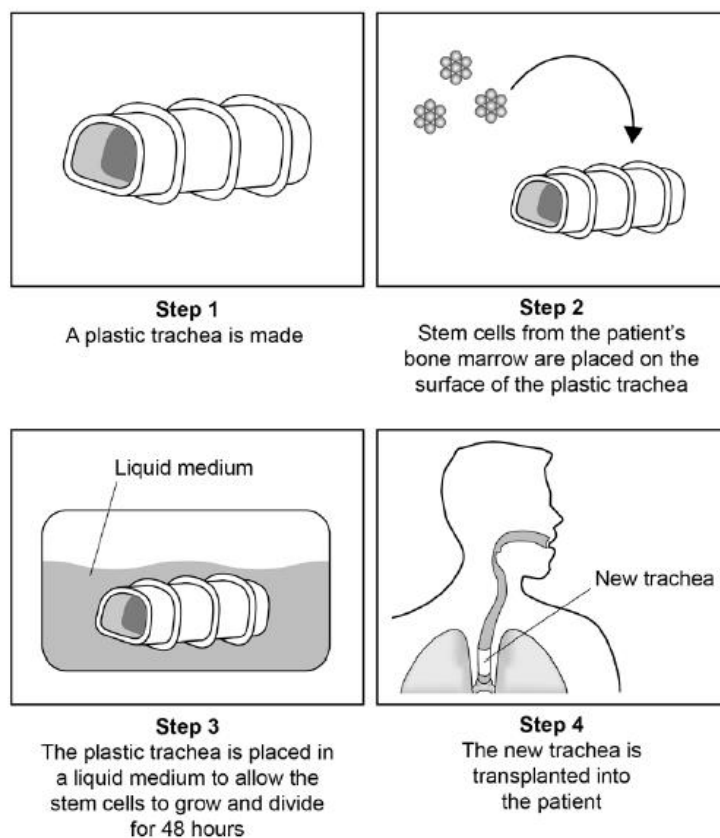


(b) Give **one** way a malignant tumour differs from a benign tumour.

(1)

Scientists can treat the patient's tumour by replacing the trachea with a plastic trachea.

The plastic trachea has a layer of the patient's own stem cells covering it. **Figure 2** shows the procedure.



- (c) In **Step 3** the cells are left for 48 hours to divide.

Name the type of cell division in **Step 3**.

(1)

- (d) In **Step 3** the cells are given oxygen and water.

Name **two** other substances the cells need so they can grow and divide.

1. _____

2. _____

(2)

- (e) Give **two** advantages of using the stem cell trachea compared with a trachea from a dead human donor.

1. _____

2. _____

(2)

- (f) Sometimes the stem cell trachea is not strong enough.

Doctors can put a stent into the trachea.

Suggest how a stent in the trachea helps to keep the patient alive.

(2)

- (g) Stem cells can also be obtained from human embryos.

Evaluate the use of stem cells from a patient's own bone marrow instead of stem cells from an embryo.

Give a conclusion to your answer.

(6)

Mastering Energy Changes in Chemical Reactions

The changes in energy that occur during a chemical reaction can be seen by examining the changes in chemical bonding. This can be used to classify reactions as exothermic or endothermic.

During a chemical reaction:

- bonds in the reactants are broken
- new bonds are made in the products

Energy is absorbed to break bonds. **Bond-breaking** is an **endothermic** process.

Energy is released when new bonds form. **Bond-making** is an **exothermic** process.

TASK 1 – Use your own knowledge and the internet to complete the table below.

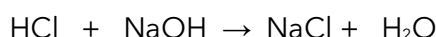
	Endothermic	Exothermic
Definition		
Examples of reactions		
Labelled energy diagram		

TASK 2 – Define the term ‘activation energy’. Add this as a label to your energy diagrams above.

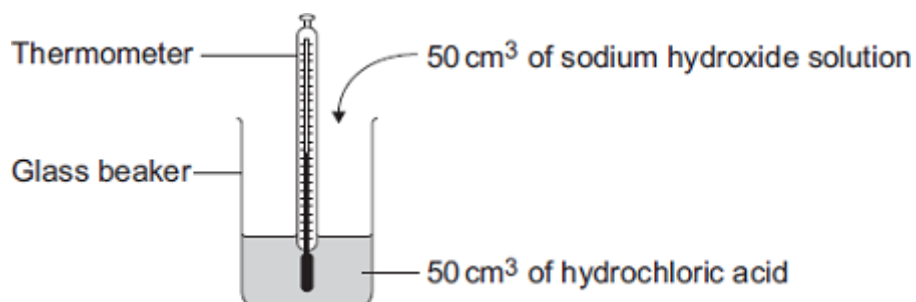
Q1. Read the information about energy changes and then answer the questions.

A student did an experiment to find the energy change when hydrochloric acid reacts with sodium hydroxide.

The equation which represents the reaction is:



The student used the apparatus shown in the diagram.



The student placed 50 cm³ of hydrochloric acid in a glass beaker and measured the initial temperature.

The student then quickly added 50 cm³ of sodium hydroxide solution and stirred the mixture with the thermometer. The highest temperature was recorded.

The student repeated the experiment, and calculated the temperature change each time.

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Initial temperature in °C	19.0	22.0	19.2	19.0
Highest temperature in °C	26.2	29.0	26.0	23.5
Temperature change in °C	7.2	7.0	6.8	4.5

(a) The biggest error in this experiment is heat loss.

Suggest how the apparatus could be modified to reduce heat loss.

(1)

(b) Suggest why it is important to mix the chemicals thoroughly.

(1)

- (c) Which **one** of these experiments was probably done on a different day to the others?

Give a reason for your answer.

(1)

- (d) Suggest why experiment **4** should **not** be used to calculate the average temperature change.

(1)

- (e) Calculate the average temperature change from the first three experiments.

Answer = _____ °C

(1)

- (f) Use the following equation to calculate the energy change for this reaction.

Energy change in joules = $100 \times 4.2 \times$ average temperature change

Answer = _____ J

(1)

- (g) Which **one** of these energy level diagrams represents the energy change for this reaction?

Give a reason for your answer.

Diagram A

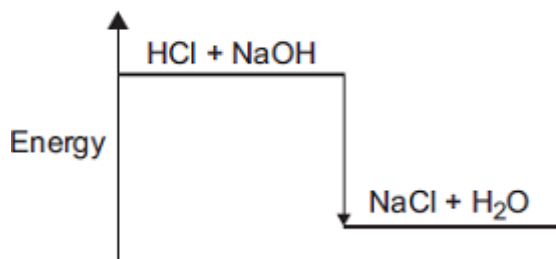
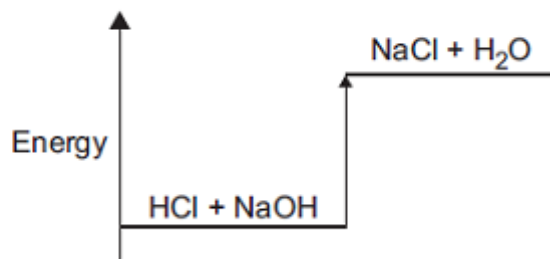


Diagram B

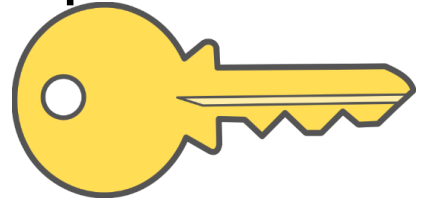
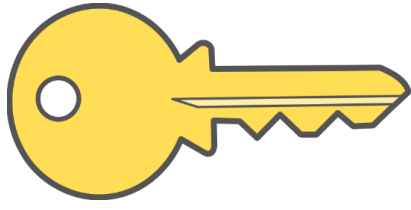


(1)

(Total 7 marks)

Religious Education

Lesson 1 – Key Concepts in Christianity



1. **Omnipotent:** The belief that God is all.....With God's omnipotence, He created the world in six days and on the seventh day, He rested.
2. **Omnibenevolent:** The belief that God is all-loving. God loves us so much that he sent his one and only Son,, to save the sins of humanity.
3. **Trinity:** The belief that God is a God – in three parts: the Father, the Son and the Holy Spirit. Each part is distinct and separate, yet of the same
4. **Incarnation:** This is the belief that God came to earth in human, i.e. Jesus. This is told in the Nativity story in the Bible, where Jesus was born to Mary – a
5. **Atonement:** "At-one-ment" means to say sorry and.....with God for your sins. Because of Jesus' sacrifice, humans are able to atone with God for their
6. **Resurrection:** This is the belief that Jesus came back to life after he was For Christians, this reflects the belief in life after death and the Hope of the spiritual resurrection of the
7. **Sacraments:** This is a ceremony where a person receives grace. For example, in the Sacrament of Baptism, a person's sins are washed away and they receive God's grace as they become a member of God's
8. **Evangelism:** Spreading.....to others and to convert others to your faith. Missionaries go to other communities and countries to tell the world about Jesus and spread the (the 'good news').

Word Box

Gospel
Virgin
Powerful
Faith
Soul
Tripartite
Jesus
Family
God
Form
Reconcile
Sins
Crucified

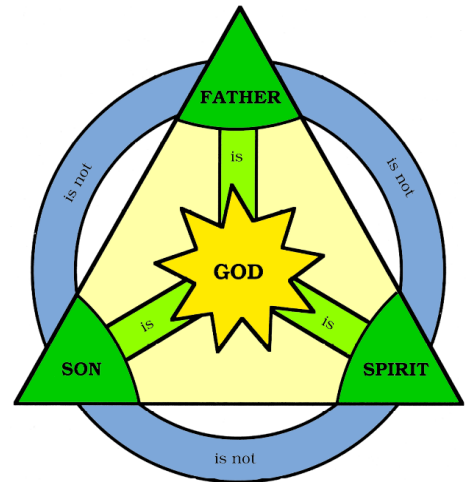


You will need to learn these words and definitions for your exam! In our a) style questions, you will have to give a definition and an example for each word!

The Nature of God

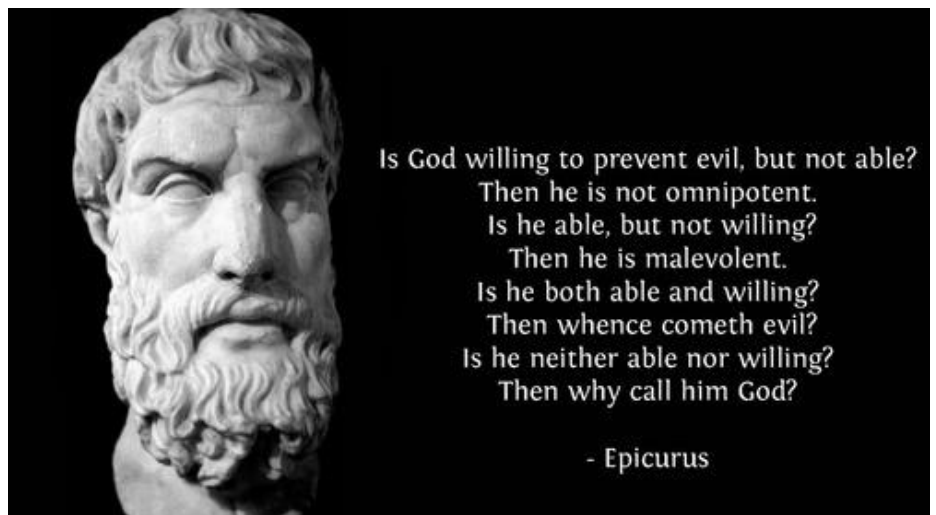
God is:

- **The Trinity:** God is one, but is known through three distinct(separate) persons: God the Father, God the Son and God the Holy Spirit. This is known as the Holy Trinity.
 - Jesus said, "*I and the Father are one*" (John 10:30)
 - Jesus said, "*I am the way and the truth and the life. No one comes to the Father except through me.*" (John 14:6)
- **Omnipotent:** God is all-powerful and can do anything. In the beginning, God created the world and since then, God has been involved in the lives of the people on earth. In Exodus, God sends seven plagues down on the land of Egypt to convince the Pharaoh to let the Jews go free.
- **Omnibenevolent:** He loves the world and all the people in it so much that He sent his son, Jesus, to teach people about Him and to save them from their sins. God is full of mercy and offers forgiveness to all willing to receive it - all who want to reconcile.
 - God is, '*abounding in love*' (Psalm 86:15)
 - "*For God so loved the world that he gave his one and only Son, that whoever believes in him shall not perish but have eternal life*" (John 3:16)
 - "*Nothing... will be able to separate us from the love of God.*" (Romans 8:39)



Evil and

Suffering: Some people believe that the existence of evil and suffering in the world is reason for there not to be a God. If God is all-powerful - so can do anything, and is all-knowing - so knows that evil exists, then why doesn't he do anything about it? This is called the problem of evil.



Is God willing to prevent evil, but not able?
Then he is not omnipotent.
Is he able, but not willing?
Then he is malevolent.
Is he both able and willing?
Then whence cometh evil?
Is he neither able nor willing?
Then why call him God?

- Epicurus

There are several Christian responses to the problem of evil:

1. Good can come out of suffering
2. Religious communities can help those who are suffering through charity work and prayer
3. Suffering is not God's fault. It has come into the world because of:
 - a. Free will (we choose to do evil)
 - b. The 'original' choice to disobey God (Adam and Eve)
 - c. Human nature not being perfect. We do make the wrong choices sometimes!
4. Evil must exist in order for good to exist. We could not have one without the other, just like we cannot have dark without light, or up without down
5. Suffering can lead to inner strength and ability to overcome suffering and succeed
6. Suffering can be a way of participating in the saving work of Jesus, e.g. through charity work (Christian Aid)

In the **Book of Job** in the Bible, God tests Job's faith by removing all of his luxuries. The cause of the evil in this story, is God, however some Christians might say that the suffering was part of God's greater plan and had a true purpose, even though Job could not see it to begin with.

Questions

1. Explain the Trinity.

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2. What is the meaning of 'omnipotent'?

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3. What is the meaning of 'omnibenevolent'?

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4. What is the quote about God's love from John 3:16?

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5. What is the problem of evil and suffering?

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6. Explain two Christian responses to the problem of evil and suffering.

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7. What does the Book of Job tell Christians about?

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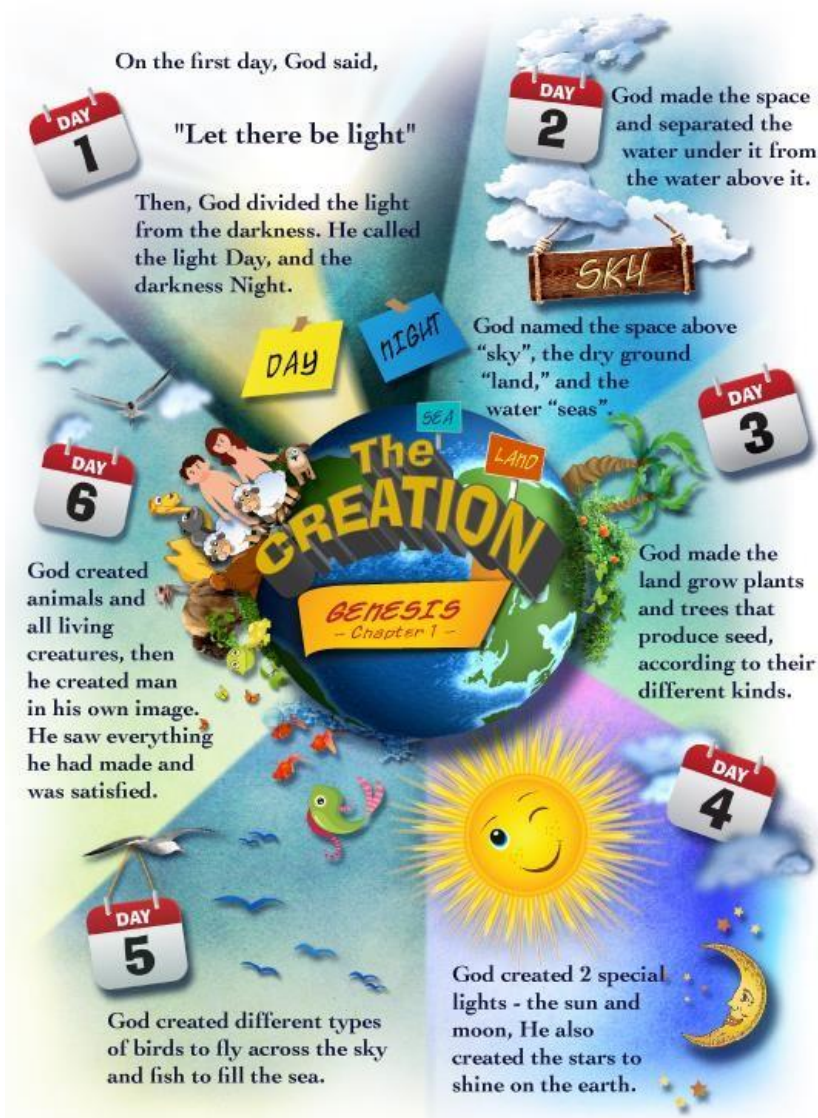
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Nature of God of Wisdom analysis

	<u>John 3:16</u> “For God so loved the world, that he gave his only Son, that whoever believes in him should not perish but have eternal life	
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Lesson 2 – Genesis Creation



What significant event occurs on each day of creation?

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2

3

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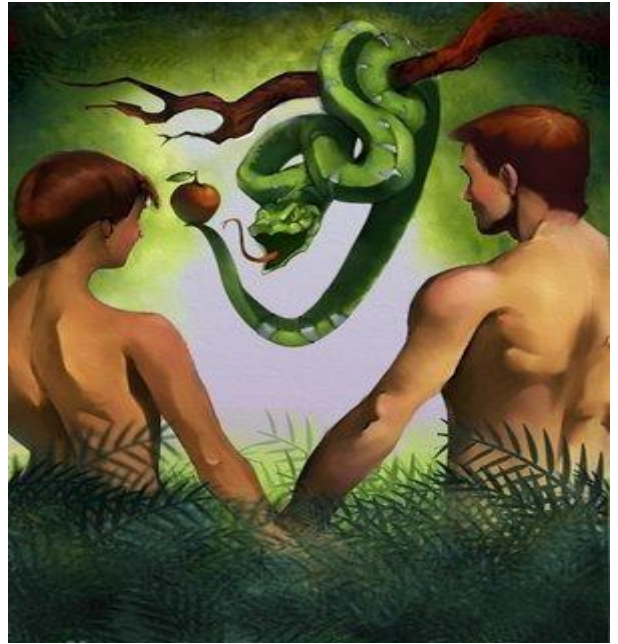
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Creation: Genesis 2 & 3

Genesis 2: God breathed life into Adam and put him in Eden. God had made the man in His image to keep Him company and look after the world. Adam named the animals but God wanted to make Adam a companion.

That night, God took a rib from Adam's side and made a woman. God told the man and woman that it was their job to take care of their new home.

Genesis 3: God warned Adam and Eve to, "Never touch the tree in the middle of the Garden. That tree gives knowledge of good and evil. The day you eat its fruit, you will die."



One day, Eve was tempted by a snake to eat from the Tree of Knowledge of Good and Evil. The snake said that by eating the fruit, Eve would become 'like God' in

knowing right from wrong. Eve took a bite and passed some to Adam.

Eve she had disobeyed God and knew she'd done something wrong. Adam and Eve became unhappy and fearful of God. God was sad that Adam and Eve had disobeyed them. He told them that they had to leave the Garden of Eden, "From now on you'll have to scratch a living from the soil. You'll need to make clothes and grow food. Nothing will come easily -- not even childbirth. And one day, you will die."

1. Summarise the story of Adam and Eve

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2. What is the meaning of this story?

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Then God said, "Let us make human beings in our image, in our likeness, so that they may rule over the fish in the sea and the birds in the sky, over the livestock and all the wild animals, and over all the creatures that move along the

Now the serpent was more crafty than any of the wild animals the LORD God had made. He said to the woman, "Did God really say, 'You must not eat from any tree in the garden'?"

Genesis 3:1

Lesson 3 – Creation: Nature and Role of Humans

Literal vs Non-Literal Interpretation

Literal Christians read the Bible and believe each word to be word-for-word truth. For example, in Genesis 1 the Bible states that the world was made in six days and on the seventh, God rested.

Literal Christians would see this to mean that the world was created in six 24-hour periods.

Non-literalist Christians, however, would read that God created the world in six days, and interpret this to mean that God created the world in six periods of time, perhaps even stretching over eons.

Therefore it is important to understand that whilst all Christians believe that the Bible was given to humans from God, their understandings of the text might change. For example, some Christians would allow for human error or poetic license, whereas others would argue that each word was dictated exactly as it is written by God to the writer.

The Role of the Word and Spirit in Creation

- The Spirit was involved in creation. “[The Spirit of God was hovering over the face of the waters.](#)” (Genesis 1:1-2)
- The Spirit of God gave vital life to the vast creation, the term waters, signifies the vast expanse of creation, illustrated by the boundless expanse of the “waters”.
- The Spirit, whose omniscience (all present) and omnipotence (all-powerful) maintains life and order in the universe.
- We have an eternal spirit which will spend an eternity in heaven or hell. Our Creator is also eternal, because we are made in his image we are eternal. We have the ability to choose good from evil because we have free will like our Creator.



Questions

1. How do literal Christians interpret the Bible?

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2. How do non-literal Christians interpret the Bible?

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3. What might some people allow for when reading the Bible?

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4. How do literal Christians interpret the Bible?

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5. How do non-literal Christians interpret the Bible?

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6. What might some people allow for when reading the Bible?

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7. How was the Spirit involved in creation?

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8. Where will our eternal spirit spend eternity?

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9. Why do we have the ability to choose good from evil?

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10. What is a quote from the Bible that tells us about the role of the Spirit?

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Genesis source analysis

John 1: 1-15

"In the beginning was the Word, and the Word was with God, and the Word was God... The Word became flesh and made his dwelling among us"

Job 33:4

"The Spirit of God has made me, and the breath of the Almighty gives me life."

Lesson 4 – Jesus Christ: Incarnation

Jesus Christ, or Jesus of Nazareth, was a preacher who was born to Mary in Bethlehem. For Christians, his coming was foretold as He was to be the Son of God.

Jesus was referred to as the 'Messiah', which means anointed one' and is a saviour to a group of people. For Christians, the Messiah was Jesus Christ. Incarnation, therefore, literally means: 'God made flesh'.

Luke 1: 28-33: "Do not be afraid, Mary; you have found favour with God. 31 You will conceive and give birth to a son, and you are to call him Jesus"

John 1: 14 "The Word became flesh and made his dwelling among us"

- The coming of the Messiah was foretold in the Old Testament.
- Christians believe the Messianic prophecies were fulfilled in the mission, death, and resurrection of Jesus and that he will return to fulfil the rest of Messianic prophecy.
- Jesus was considered the Son of God
- From the coming of Jesus, God is present with his people in a new and decisive way.
- Even as a young boy Jesus was conscious of God's divine call on his life. Jesus knew, even at the age of 12, that he was not like other boys. He was called to his
- "Father's business," and that must be attended to, even if his parents did not understand.
- The Bible says, "The child [Jesus] grew, and waxed strong in spirit, filled with wisdom: and the grace of God was upon Him." "And Jesus increased in wisdom and stature, and in favour with God and man."



Incarnation: Questions

1. What was Jesus referred to as and what does this mean?

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2. What does 'incarnation' literally mean'?

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3. What does John 1:14 say about the incarnation?

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4. What did Jesus know, even as a young boy?

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Lesson 5 – Crucifixion: Questions:

1. What else is the story of the crucifixion of Jesus known as?

The crucifixion of Jesus (also known as the **Passion**) is a story about injustice, doubt, fear, pain and, ultimately, degrading death on the cross. It tells how God experienced these things in the same way as ordinary human beings. Christians believe that Christ's suffering and the wounds that he suffered play a great part in **redeeming** humanity from **sin**.

Another theme is **incarnation** - the death of Jesus shows humanity that God had become truly human and that he was willing to undergo every human suffering, right up to the final agony of death. Another is **obedience** - despite initial, and very human, reluctance and fear, Jesus demonstrates his total acquiescence to God's wishes.

But the final theme is **victory** - the victory of Christ over death - and this is why the Passion story is inseparable from the story of the **Resurrection**.

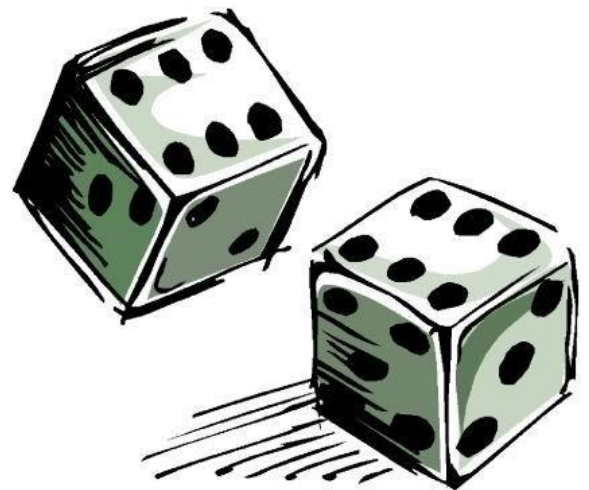
Matthew 26: 27-28 "Then he took a cup, and when he had given thanks, he gave it to them, saying, "Drink from it, all of you. 28 This is my blood of the covenant, which is poured out for many for the forgiveness of sins."

Matthew 27: 28-50: "They stripped him and put a scarlet robe on him, 29 and then twisted together a crown of thorns and set it on his head. They put a staff in his right hand. Then they knelt in front of him and mocked him. "Hail, king of the Jews!" they said. 30 They spit on him, and took the staff and struck him on the head again and again. 31 After they had

mocked him, they took off the robe and put his own clothes on him. Then they led him away to crucify him...

They came to a place called Golgotha (which means "the place of the skull")...

When they had crucified him, they divided up his clothes by casting lots. 36 And sitting down, they kept watch over him there. 37 Above his head they placed the written charge against him: THIS IS JESUS, THE KING OF THE JEWS."



Questions

1. What do Christians believe about Christ's suffering?

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1. How does Jesus show obedience in the crucifixion?

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2. What is the final theme of the crucifixion?

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3. What does Matthew 26: 27-28 say?

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4. What does 'Golgotha' mean?

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5. What happened after the crucifixion, whilst the guards were keeping watch?

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History

1. The end of World War I – betrayal (November 1918)

In August 1918, Germany was losing in WWI. The army was being led into battles that were impossible to win and following a promising German Spring Offensive, the allies were pushing Germany further and further back. A turning point occurred when the German sailors in **KIEL** refused to fight. They mutinied, meaning they refused to follow orders, and others followed suit. It led to riots in Germany and the ordinary people came out and protested against the **Kaiser** in the streets.

On 9th November 1918 the Kaiser finally gave in. He **ABDICATED** and was replaced by Friedrich **EBERT** as the new leader. President of Germany.

Ebert's first step was to sign the **ARMISTICE** with the allies. In other words he agreed to stop fighting. It was agreed that the war would end at 11am on 11th November 1918.

2. Post-War problems in Germany (1918)

How had the war caused problems for Germany?

Social Problems

- One of the biggest impacts was the social effect of "War weariness". A large amount of the population were psychologically tired and had problems with anxiety and anger at the way the war had ended.
- This was made worse by soldiers returning home and telling society that they did not believe they were being defeated.
- This defiance led to the "STAB IN THE BACK" (DOLCHSTOSS) myth. Germans started to believe that the weak politicians had conspired against the army leaders. They also blamed Jews and other minorities within government (they believed the war had ended because they were afraid of losing money) who supposedly forced the army to accept defeat.

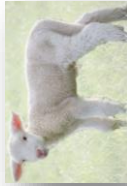
Economic Problems

- Harvests had been wasted during the war leading to losses and there was very little food.
- There was a decreased output as farmers went to war. Only around 50% of milk was produced compared to pre-war levels.
- Perhaps the worst period was the "Turnip Winter" of 1916-17. The British naval **BLOCKADE** led to a lack of imports. People relied on root vegetables for their diet and had poor nutrition.
- Starvation and disease increased with a high mortality rate amongst the ordinary people.
- Destruction of machinery also made Germany couldn't create products cheaply. Finally the huge debt caused by the war made life in Germany difficult as the government didn't spend on public needs. This was made worse by the **REPARATIONS** set by the Treaty of Versailles and the refusal of other nations to trade.

Political Problems

- When the Kaiser (Wilhelm II) abdicated there was no official leader. The role fell to the largest party in the Reichstag (German Parliament). Their leader, Ebert set up Germany as a democratic republic. Unfortunately not everyone liked this:
 - The rich who had gained power with the Kaiser didn't like that the lower classes now had power.
 - The working classes, especially communists led revolutions as well.
- As a result Ebert had to use ex-soldiers to enforce control. They were known as the **FREIKORPS**.

3. The Treaty of Versailles (June 1919)



LAND

- Valuable land was taken from Germany:
- All overseas colonies (that annoyed Germany because everyone else had them)
- Alsace-Lorraine to France (a place that they'd constantly fought over).
- Danzig (an important port meaning trade was difficult)
- Saarland (a huge industrial region making it difficult to trade and make money).
- A section of Germany was taken away to create the Polish Corridor (this gave Poland access to the sea but also split Germany in two).

MONEY

- Germany were made to pay **REPARATIONS**. They had to pay back £6.6 billion which was a huge and unrealistic amount at that time.

ARMY

- The army was reduced severely weakening Germany:
- Reduced to 100,000 men in the army.
- Only allowed 6 battalions.
- No submarines.
- No air force (**LUFTWAFFE**).
- No armoured vehicles.
- **DEMILITARISED** the Rhineland which ran along the border between Germany and France.

BLAME

- Germany was made to accept all blame for the war. This was called the **Guilt Clause** or **CLAUSE 231**.

4. The Weimar Constitution is setup (August 1919)

The first job of the new leader, Ebert, was to create a **CONSTITUTION**. This would be a set of rules to govern their country. The Weimar Constitution would be one of the biggest reasons for hatred in the 1920s as although it appeared positive and democratic there were a lot of downsides.

Strengths of the Weimar Constitution		Weaknesses of the Weimar Constitution
People were represented well and everybody's views were given a chance, young or old, rich or poor. They elected the government by PROPORTIONAL REPRESENTATION meaning that even the smallest parties would get a seat in the REICHSTAG (German Parliament).	ISSUE 1 The system was very democratic, everyone over 20 could vote.	There were that many people allowed to vote that there was in fact too much freedom. The government can not help everyone at once.
The smaller parties in Germany represented people with marginalised views. In other systems they wouldn't get seats in the Reichstag. Now though, they could try to represent their small groups of voters.	ISSUE 2 Any party could get seats in the Reichstag no matter how small.	There were so many small parties in the Reichstag that all they did was argue. It also allowed the extremists such as the Nationalists and the Communists to get seats meaning they gained a more respectful and legitimate image.
Ideally this meant that the chancellor would be from the party with the most votes. Therefore the leader represented most of the people in the country.	ISSUE 3 The Chancellor was the leader of the largest single party.	The largest party couldn't get more than half of the votes meaning the chancellor didn't really represent the voters. They would often have to form a "Coalition" with other parties or go it alone without support of the majority.
The President could help the country out if it was in danger. It meant that he could be a strong leader if any problems arose.	ISSUE 4 Article 48 stated that the President could rule directly in a crisis.	Germany had just got rid of a dictator. Article 48 could bring it back and let one man rule the country how he pleased.

5. Political Opposition (1919-20)

Left-wing opposition

EQUALITY of outcome for all. In other words, everybody comes out with the same amount in the end. This is known as **SOCIALISM** or **COMMUNISM**:

- Free healthcare and education
- High amounts of welfare / benefits
- High tax on the rich with money going to the poor
- Government own all industry and share out the profits

What do they want?

They think that the constitution isn't left-wing enough. They think that because people can vote for whoever they want then the right-wing groups still have some power.

They would rather get rid of elections all together and create a **COMMUNIST** state based on the ideas above.

Why do they hate the Weimar Government?

The **WORKING CLASSES** were the main people that supported the left-wing ideas. They had the most to gain from it, whilst the rich hated it.

Who supported them?

Right-wing opposition

NATIONALISM: They think that Germany should be the strongest of all the nations and they can reach that by encouraging individuals to be strong:

- People should pay their own way for things like healthcare and schools.
- There should be no benefits or welfare for the poor.
- Taxes should be low to encourage people to work more and keep all their profits.
- Individuals should own businesses and try to make as much money as possible.

They think that the constitution is too left wing. They think that it gives far too much to the poor and gives them too much power. They also hate the Treaty of Versailles because it makes Germany look weak.

They would rather get rid of elections all together and create a **DICTATORSHIP** with the Kaiser reinstated based on the ideas above.

The **UPPER CLASSES** and soldiers were the main people that supported the right-wing ideas. They had the most to gain from it, whilst the poor and needy hated it as it gave too much power to the rich and powerful.

To fulfil their aims, the right-wing had a **REVOLUTION (PUTSCH)**. This was known as the **KAPP PUTSCH** uprising:

- Led by Wolfgang **KAPP**, the Freikorps took over Berlin in 1920.
- Kapp was a leader of the Freikorps who were annoyed at the strength of the working classes. They were also disappointed by the treaty and wanted to return Germany to former glory.
- Again, Ebert struggled to stop the uprising so he looked for help elsewhere.
- The army refused to shoot on the Freikorps as they had fought together in WWI.
- Ebert then asked the workers to go on strike. This worked because the Freikorps couldn't run a country that wasn't working!
- THE UPRISING FAILED**

To fulfil their aims, the left-wing had a **REVOLUTION**. This was known as the **SPARTACIST** uprising:

- Led by Karl **LEIBKNECHT** and Rosa **LUXEMBURG**.
- In 1919 a riot started in Berlin because the chief of police was sacked. He was a big supporter of the working classes.
- The Spartacists used this as an excuse to start their own uprising.
- Ebert needed to stop the uprising BUT the army was too weak. Instead he used the **FREIKORPS** (a group of ex-soldiers who had returned from WWI but kept their weapons). About 250 000 of them stopped the Spartacist Uprising. They killed well over 1000.
- The leaders Leibknecht and Luxemburg were also murdered. They were both arrested and killed by the Freikorps without trial (Leibknecht was forced out of a car and shot in the back, Luxemburg was beaten, shot in the head and thrown in a canal).
- THE UPRISING FAILED**

How did they try to takeover the country?

6. Hyperinflation / Year of Crisis (1923)

Germany was required to pay 132 000 million gold marks every year. However, Germany struggled to pay the reparations and in 1923 the German government announced it would not be able to pay because of:

- The obscenely high cost
- The loss of the industrial region of the Saarland.

The British agreed, but the French insisted that Germany must pay. Due to the missed payment, in January 1923, the French government sent 60 000 troops to the **RUHR**, the remaining centre of German industry.

They seized control of all mines, factories and railways. They took supplies from shops and set up machine-gun posts in the streets.

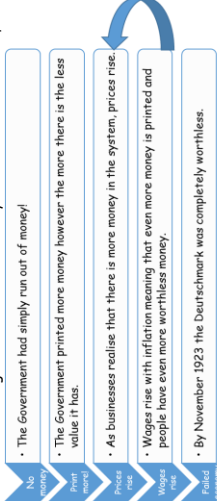
The results were disastrous for Germany:

- The German government told workers not to co-operate with the French. All workers went on strike. This policy was known as **PASSIVE RESISTANCE**: it was a non-violent protest against the invaders.
- Despite this, 140 Germans were killed in clashes with the troops.
- The workers who went on strike received money from the German government to support their families. This cost the government a lot of money. To make matters worse, no money was coming in from the Ruhr.

Solutions

Gustav **STRESEMANN** became the new chancellor of Germany in 1923. He came up with three key solutions to hyperinflation:

- He sent the workers back to their jobs in the Ruhr and promised the French their money.
- He signed the **DAWES PLAN** which changed the repayment schedule.
- He borrowed money from the USA to help pay the reparations.
- He then destroyed the old currency and replaced it with a new one called the **RENTENMARK**.



- The Middle classes lost the most. They had savings and pensions in the banks that were now worthless. What could once be enough to buy a house couldn't buy a loaf of bread.
- The working classes were not affected as badly. They had no savings to lose like the rich. Their rent also ended up cheaper as they were only contracted to what they had always paid, yet were getting billions in wages.

7. The Golden Years (1924-29)

Positives	Negatives
- Working class wages rose by about 10% between 1923 and 1928. - Around 200 000 affordable houses were built. - Homelessness was reduced by 60%. - Created benefits for the unemployed. - Benefits to families of the war dead as well as single mothers and disabled people to help them live. - Women over 20 were given the vote. - Girls were given the same education as boys. - Women moved into new job sectors such as government jobs (civil service). - Women gained new social freedoms. They could smoke and drink in public. - Fashion changed with more revealing clothing. - Art and literature could criticise the government. - A new architectural style called BAUHAUS changed the country. It became less traditional and used new and forward thinking styles.	- There was a large rise in unemployment amongst the middle classes. - Many of the middle classes never got their savings back after hyperinflation. - There weren't any more women employed in total than there had been before. - Many people criticised the new role of women. CONSERVATIVES argued that they were neglecting their families by going to work. - Many Germans disliked the new ideas. They thought that Germany was losing its history and allowing people to show weakness. - Germany became reliant on foreign money. - The Locarno Treaty was further acceptance of the Treaty of Versailles: another betrayal. - Kellogg Briand Pact seen as weakness militarily by Germans.
Standard of Living	Women
Culture	Politics
- The Dawes Plan (1924) and YOUNG PLAN (1929) made the reparations easier to repay with loans from the USA. LOCARNO TREATY (1925) accepted the Treaty of Versailles. This allowed them to join the League of Nations and become a big nation in Europe again. KELOGG-BRIAND PACT stated that countries would solve disputes through peace not violence.	

Using the 100% sheet, complete the recall questions and revision flashcards on Left and Right wing opposition.

1. What did the LEFT wing believe in?
2. Who supported the LEFT wing?
3. What happened in the Spartacist uprising?
4. What is NATIONALISM?
5. What do the RIGHT wing believe in?
6. Who supported the RIGHT wing?
7. What happened in the Kapp Putsch?

LEFT WING**RIGHT WING****LEFT WING****Spartacist uprising****Kapp Putsch****RIGHT WING**

Remedy 1 - History - Interpretation skills.

Complete the practise questions for the interpretation questions on Paper 3.

Interpretation 1: From *The Weimar Republic, 1918-24* by M. Rathbone, published in 2013.

Some democratic parties did support the Weimar Republic. However, powerful political groups on both the Left and the Right refused to accept the existence of the Weimar Republic. They were prepared to destroy it by force and replace it with their own form of government. They took action against the Republic very soon after it was created. This made it difficult for the new government to maintain order and govern Germany.

Interpretation 2: From *Alpha History*, a history website.

The hyperinflation which happened in 1923 forced the Weimar government to fear for its own existence.

After the French had occupied the Ruhr, the industrial workers had gone on strike. The Weimar government supported the strikers by printing more paper money in order to pay them. As the strike continued, the government could not find a solution and simply printed even more money. This ruined the economy. People talked openly about removing the government by a popular revolution or a military putsch.

Summarise interpretation 1: What is it telling you?

Summarise interpretation 2: What is it telling you?

Sources/interpretations for use with Section B.

Source B: A photograph published in a German newspaper in March 1920. It shows Freikorps soldiers taking part in the Kapp Putsch. The soldiers are occupying an area in Berlin near to the Reichstag building.



Source C: From an interview with a German woman in 1974. She was a factory worker during the early years of the Weimar Republic. Here she is recalling the hyperinflation of 1923.

You got paid at the end of every day. You had to spend it straight away because the next day your wages would only be worth half as much as the day before. Money was literally not worth the paper it was printed on.

Many people who had their savings in bank accounts lost all the money they had managed to scrape together. We asked ourselves, 'How can that happen? How is it that the government can't control this inflation which wipes out the life savings of most people?' We never got an answer that meant anything.

After the hyperinflation, people didn't trust the government anymore.

Which interpretation does source B support?

Quotes:

Which interpretation does source C support?

Quotes:

Success Criteria:

Q3b -

- Summarise the Int. ✓
- Quote to support. ✓
- Repeat. ✓

Q3 Study interpretations 1 and 2. They give different views on the main way ...



4 mark Interpretations - What's different?

Interpretation	Evaluation	Interpretation
In interpretation __ I can... The interpretation suggests that	On the other hand / however / in contrast	In interpretation __ I can... The interpretation suggests that

Success Criteria:

Q3c -

- 'Give weight to different sources'. ✓
- Summarise the Int. ✓
- State which source it supports. ✓
- Repeat. ✓

Suggest ONE reason why interpretations 1 and 2 give different views about the ways...

4 mark Interpretations - Why do they differ?

Interpretation	Source	Evaluation
In interpretation __ I can...	This is supported by source...	On the other hand / however / in contrast
Interpretation	Source	Eval - Judgement
In interpretation __ I can...	This is supported by source...	Overall / in conclusion

Study Interpretations 1 and 2. They give different views about the challenges facing the Weimar Republic in the years 1919-1923. What is the main difference between the views?

Suggest one reason why Interpretations 1 and 2 give different views about the challenges facing the Weimar Republic in the years 1919-1923. You may use Sources B and C to help explain your answer.

Remedy 3 - History - Weimar Germany

Complete the knowledge revision about the Year of Crisis & The 'Golden Years'. Use your 100% sheet to answer the recall questions, and complete revision flashcards.

1. Why was the Ruhr an important area for Germany?
2. What was Passive Resistance?
3. How did the hyperinflation effect the Middle Classes/Working Classes?
4. Who was Stresemann? What did he introduce
5. What was a POSTIVE and NEGATIVE of the standard of living changes during the Golden Years?
6. What was a POSTIVE and NEGATIVE for women during the Golden Years?
7. What was a POSTIVE and NEGATIVE of culture changes during the Golden Years?

Hyperinflation -
CAUSES

Hyperinflation -
EVENT

Hyperinflation -
EFFECT

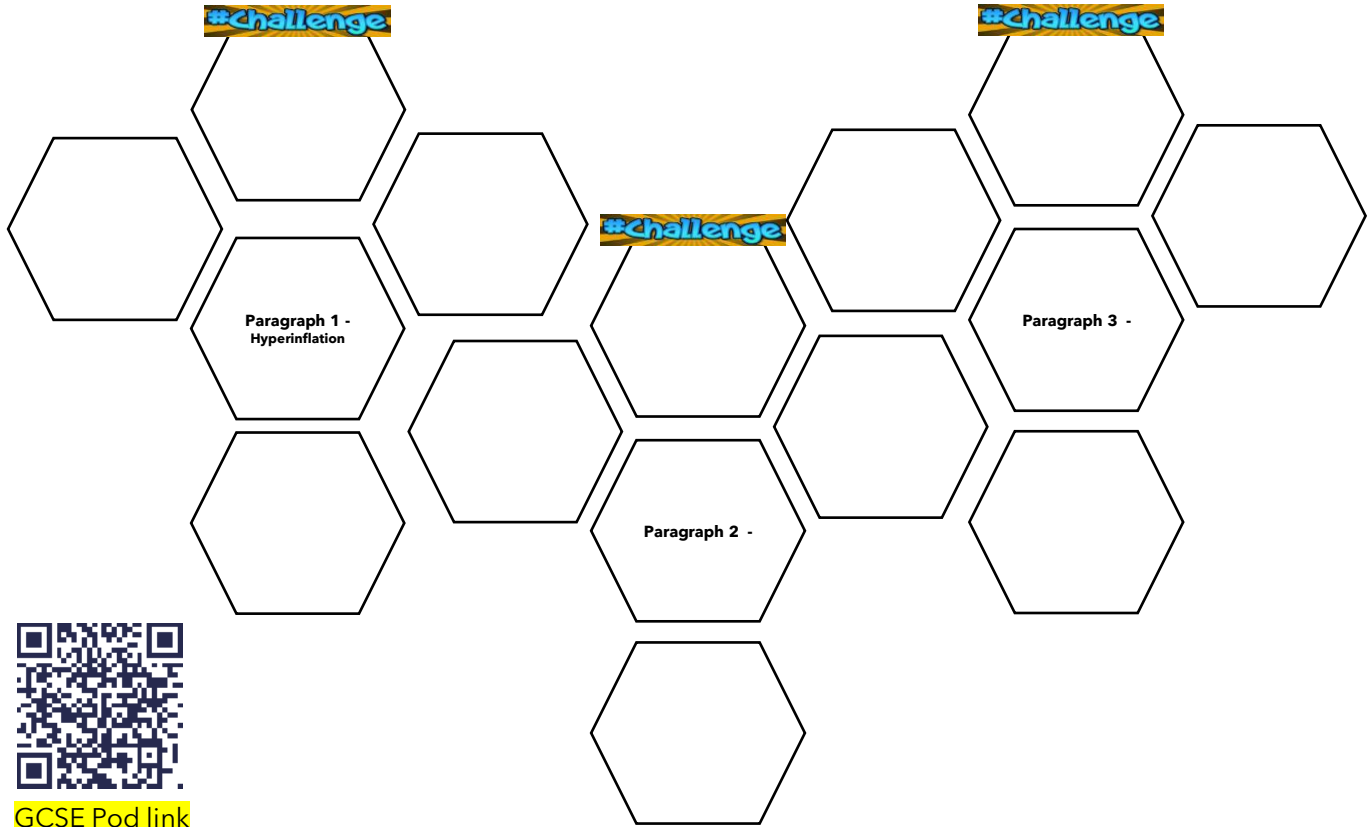
Standard of living

Women

Culture/Politics

Remedy 4 - History - 12 mark Q skills.

Complete the knowledge hexagons relevant to the paragraph point. Outline your main arguments for all three paragraphs in the BTA section below. **'Explain why there was a 'year of crisis' in 1923'.**



	because:	Therefore	As a consequence ...
	because:	Therefore	As a consequence ...
	because:	Therefore	As a consequence

Geography

Remedy 1 - Geography

Complete the flow charts to explain the case study facts

Nepal 2015

7000 schools were destroyed



So what?



So what?

Nepal 2015

An avalanche on Mt Everest killed 19 people



So what?



So what?

Nepal 2015

250,000 tents were sent to provide shelter



So what?



So what?

L'Aquila 2009

10,000-15,000 buildings collapsed



So what?



So what?

L'Aquila 2009

University applications to the University of L'Aquila declines



So what?



So what?

L'Aquila 2009

Within an hour, the Italian Red Cross were searching for survivors



So what?



So what?

E Opportunities	
Integrated Transport Systems	Different transportation systems that area connected and work together. The Supertram has 48 stations across Sheffield, including outside of the main train station and outside of bus terminals. Over 9.3 million journeys are taken annually.
Cultural Mix	The different cultures in Sheffield bring with them their own food, ideas, music and traditions. These combine with Sheffield enhancing the culture of Sheffield. Sharrow festival attracts thousands annually
Urban Greening	Sheffield is investing £1.5 million towards improving parks and green space to support public health in the most deprived communities. Sheffield contains over 2 million trees.
Recreation and entertainment	Meadow Hall is the 4 th largest retail area in the UK. It provides employment opportunities for students. Sheffield has numerous other entertainment facilities like the crucible which held the World Snooker Championships in 2015. Over 210 million watched it worldwide.
21 st Century economy	Sheffield has seen major investment from global firms offering good jobs to residents. Boeing has created a hub factory. The public sector (education, NHS and government) employ 26% of people. Steel industry is automated but still generates over £7 billion.

Rural Urban Fringe

As cities grow, they occupy more and more land. The areas on the edge of the city are called the urban fringe. These fringe areas often see commuters move here seeking more space, less pollution and lower crime rates. However these commuters also increase the price of houses, and create traffic congestion as many of them drive to their places of employment. The fringe communities also build on greenfield sites, reducing the amount of greenspace and farmland there is surrounding a city. Local economies are boosted, but large chain stores often move into these areas and can outcompete local shops like green grocers and butchers.

H Kelham Island Regeneration

Kelham Island faced significant challenges beyond environmental and social issues, including high levels of violent crime and drug use. The area's declining economic prospects and the resulting lack of job opportunities had contributed to a sense of neglect and despair among its residents. The regeneration efforts that began in the 1990s aimed to address these challenges and improve the quality of life in Kelham Island.

Historic industrial buildings in Kelham Island were restored and converted into modern residential and commercial spaces, such as the Grade II listed Cornish Place Works which now has 52 apartments.	New parks and public spaces like the Kelham Island Museum and Victoria Quays were created. The museum attracts about 125,000 visitors annually	Kelham Island's public transport links were enhanced with new tram and bus routes. Shalesmoor tram stop, serving the area, had over 2.2 million passengers in 2019.	Developed over 100 new independent businesses to the area, including award-winning craft brewery. The Kelham Island Brewery, as well as cafes, bars, and restaurants	Kelham Island regeneration preserved its industrial heritage with initiatives like the Kelham Island Heritage Trail, featuring 13 plaques that highlight the area's history as an industrial hub.
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F Challenges

Housing	Areas with high-income workers are larger and more costly than those in the city centre. Endcliffe's semi-detached houses sell for over £515,000 and increase in value by 15% annually, while those in Darnall sell for £170,000, decreasing by 6% per year. Endcliffe's rent is higher (£717/month), but the percentage of home ownership is also higher. In contrast, Darnall's average rent is lower (£515/month), but over 1400 rental households result in a lower percentage of home ownership.
Education	there are significant discrepancies between affluent and deprived areas in terms of education. In areas like Endcliffe, GCSE results are higher, with 85% of students achieving at least a grade 4 in English and Maths. However, in Darnall, only 54% of students received a grade 4 in both subjects, and 39% can read at the expected level, compared to 82% in Endcliffe. Nationally, students in Sheffield perform slightly below the average.
Health	Sheffield has health disparities despite equal access to healthcare. Darnall faces health issues such as high obesity rates in year 6 children, low life expectancy, high smoking-related deaths, and a significant number of adults not exercising. Conversely, Endcliffe has lower obesity rates, higher life expectancy, fewer smoking-related deaths, and a lower percentage of adults not exercising
Employment	Darnall and Endcliffe exhibit notable disparities in income and employment. Darnall has over 400 households earning less than £10,000, with 57% of people over 16 having never worked. In contrast, Endcliffe has 17% of households earning over £75,000, with only 3% of people over 16 having never worked. Most Endcliffe workers hold professional or upper management positions, while Darnall's majority works low-skill jobs.
Waste management	Sheffield faces environmental challenges, including a waste incinerator and derelict buildings. The incinerator, located in the city's eastern area, burns waste to generate energy but has faced criticism over air pollution and health concerns. Sheffield also has many abandoned buildings that pose safety hazards and blight the landscape. However, some of these structures are being repurposed for housing and business, revitalizing previously neglected areas.

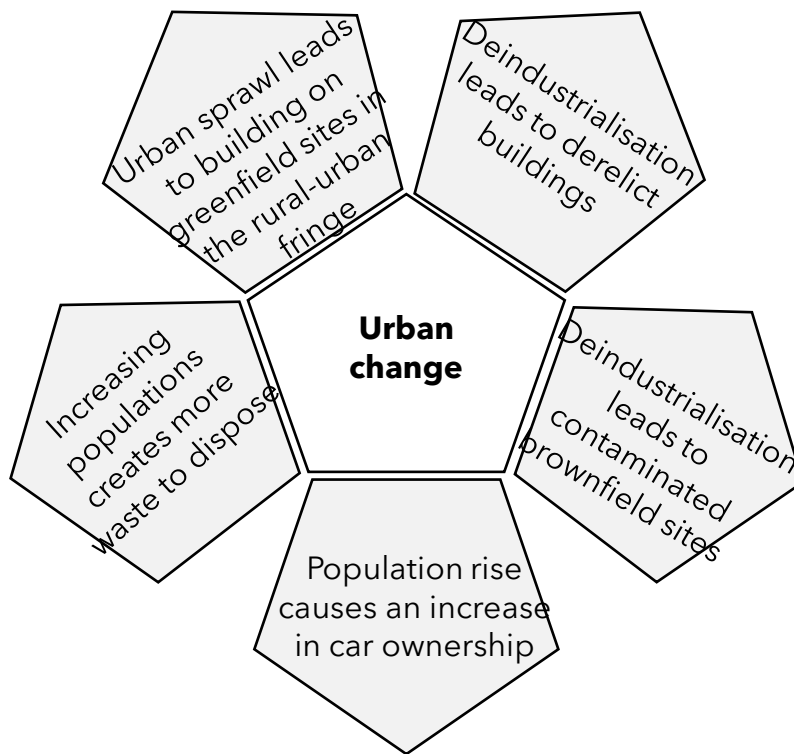
I Sustainable Urban Living

Freiburg, Germany is a city known for its sustainable urban development. It has many green spaces, pedestrian zones and bike lanes. Public transport is encouraged and sustainable housing is promoted. Freiburg shows how cities can be developed in an environmentally friendly way

Freiburg's water management involves a decentralized approach that utilizes permeable surfaces, green roofs, and rainwater harvesting to reduce stormwater runoff and minimize the risk of flooding.	Freiburg generates over 100% of its electricity consumption through renewable sources, with solar panels on public buildings, wind turbines, and a hydroelectric plant on the river Dreisam.	Freiburg promotes waste reduction, recycling, and composting. The city's recycling rate is over 60%, and it has a "zero waste" target by 2050. The city also operates a biogas plant that processes organic waste and produces renewable energy.	Freiburg promotes sustainable transport by encouraging cycling and walking, as well as having an extensive tram and bus network. Over 70% of trips in the city are made by sustainable modes of transport, and the city aims to be car-free by 2050.
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Remedy 2 - Geography

Annotate the hexagons with how they present challenges for UK cities
Use the 100% sheet to link to Sheffield and how they are being overcome



Remedy 3 - Geography

Some exam questions will provide you with a figure. This will be something you have not seen before but will link to a topic you have studied. The figure below is an image and a newspaper clip from Hurricane Irma in the Caribbean, though you have not studied this, it links to your case study of Typhoon Haiyan in the Philippines

For figure questions, you will often have to talk about the figure **and** a case study in order to reach a level 3 answer (minimum 4/6 or 6/9)

'Hurricane Irma hit several islands in the Caribbean on 6 September 2017, with devastating consequences for the local population. On Sint Maarten, it has so far resulted in eight deaths. Officials say that 95% of the island has been destroyed and the international airport and harbour have been seriously damaged. Power, running water and most communications have been knocked out by this powerful storm.'



Photo: Overturned shipping containers in Sint Maarten

0 1. 1 2

Assess the extent to which tropical storms have effects on people and the environment.

Social

Typhoon Haiyan,
Philippines

Image and news
article above

Use **Figure 5** and an example you have studied.

[9 marks]

This question requires 4 things to be discussed - social impact, environmental impacts, the figure and your case study
The best way to answer is to make pairs
For example, use an environmental impact from the figure and a social impact from your case study (or vice versa)

Case study information

The sections in boxes are what is needed for the question – remember from here you only need either **one environmental** impact or **one social**

The background information and other facts can be used to add detail and clarify if necessary

Typhoon Haiyan (2013)

Causes

Typhoon Haiyan was a tropical cyclone that affected the Philippines in South East Asia in November 2013. It was one of the strongest tropical cyclones ever recorded with winds of 313 km/h. In some areas, 281.9 mm of rainfall was recorded, much of which fell in under 12 hours. Waves of up to 7 m in height battered the coast. The Philippines is a fairly poor part of the world with minimal investment in prediction, planning and protection schemes.

Effects

Economic effects

- The overall economic impact of Typhoon Haiyan is estimated at \$5.8 billion (£3.83 billion).
- Six million workers lost their sources of income.
- Major rice, corn and sugar-producing areas for the Philippines were destroyed affecting the country's international trade and farmers' incomes.

Social effects

- More than 6,000 people were killed by Typhoon Haiyan.
- 1.9 million people were left homeless and more than 6,000,000 displaced.
- There were outbreaks of disease due to the lack of sanitation, food, water, shelter, and medication.
- In the city of Tacloban, widespread looting took place in the days following the typhoon.

Environmental effects

- Widespread floods damaged and in many cases destroyed homes and businesses in coastal areas.
- Thousands of trees were uprooted leading to a massive release of carbon dioxide and loss of habitat with resulting effects on wildlife.
- Major roads were blocked by trees, and were impassable.

Responses

- Even though the loss of life was significant, it could have been much worse if not for the efforts of the Philippines' meteorological agency. It broadcast warnings leading to the evacuation of approximately 750,000 residents.
- The UK government provided food, shelter, clean water, medicine and other supplies for up to 800,000 victims.
- Several charities provided emergency aid such as water, food and shelter.
- The United Nations launched an international aid appeal in December 2013 for £480 million to finance the humanitarian relief effort for 2014.

Remedy 3 - Geography

Use the case study facts and the figure to plan an answer to this question
You only need to choose **one** case study fact (as a minimum) and **one piece of information** from the figure (this can either be seen in the image or a fact from the news article)

It can be tempting to use all the facts from the figure, but this is called lifting and you will not receive any credit, the marks come from the explanations as to why these are severe effects

0 1 . 1 2 Assess the extent to which tropical storms have effects on people and the environment.

Use Figure 5 and an example you have studied.

[9 marks]

Social or environmental impact from Typhoon Haiyan



Element of judgement - how big of an effect is this?



Why?



So what?

Social or environmental impact from the figure



Element of judgement - how big of an effect is this?



Why?



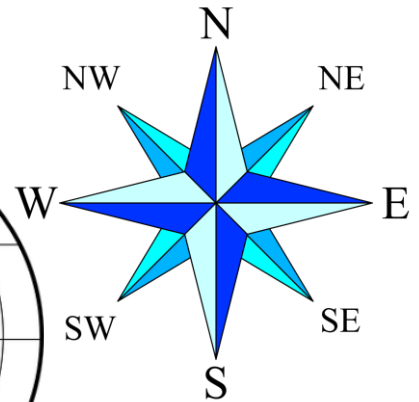
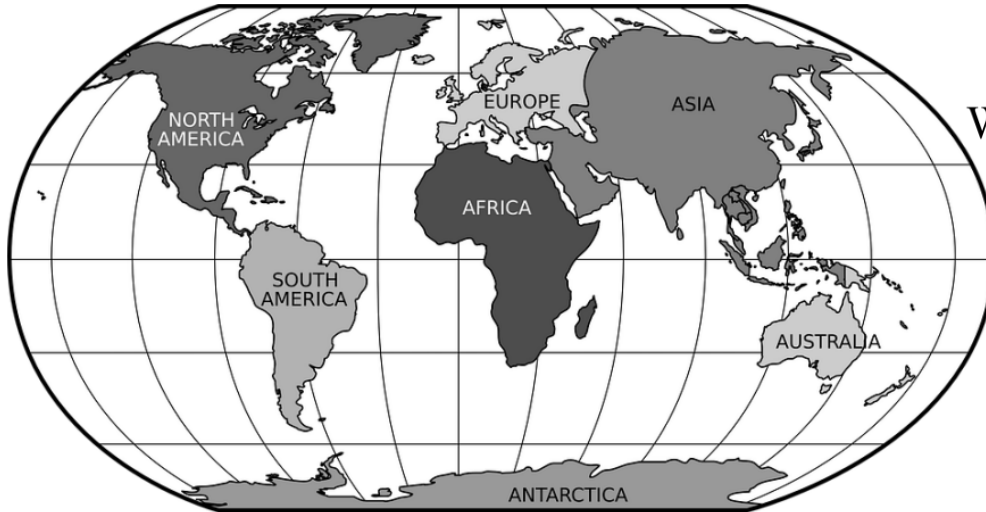
So what?

Conclusion - give an overall opinion

Remedy 4 - Geography

Describing distribution and locations are a key geographical skill

Use the example, compass and world map to help you



EXAMPLE

Describe the location of Kenya

Kenya is a country located on the East coast of Africa. The eastern coast of Kenya meets the Indian ocean. Kenya also borders Ethiopia and Somalia to the North, Uganda to the East and Tanzania to the South.



Describe the location of France



Remedy 4 - Geography

Describe the location of Brazil



Describe the location of Sheffield



Use the T.E.A acronym to describe distribution on a graph or map

Trend - what is the general pattern

Example - use some data from the figure to represent the trend. This can be data from a graph or locations and compass points on a map

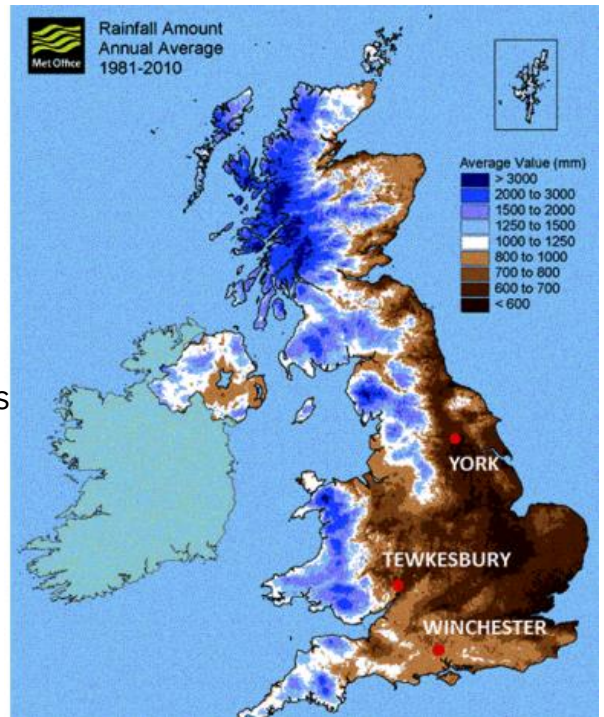
Anomaly - something that doesn't fit the trend (if there isn't one, don't make one up)



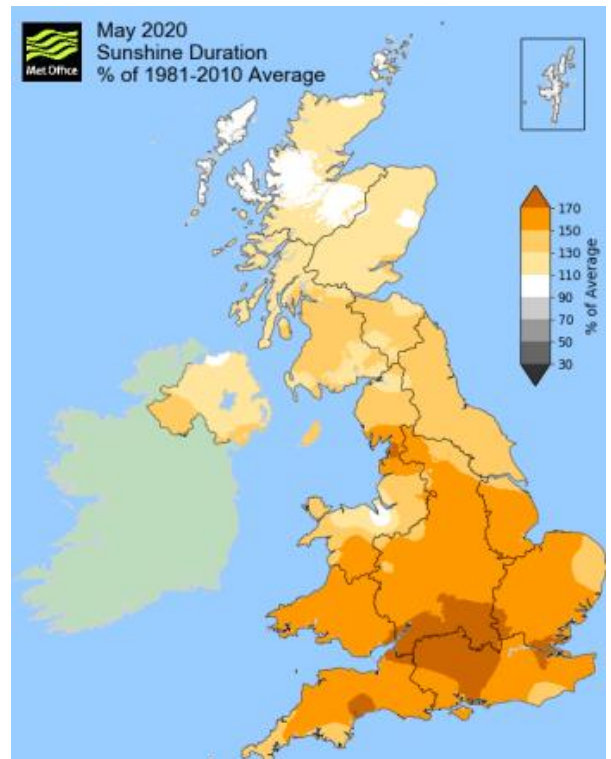
EXAMPLE

Describe the distribution of rainfall in the UK

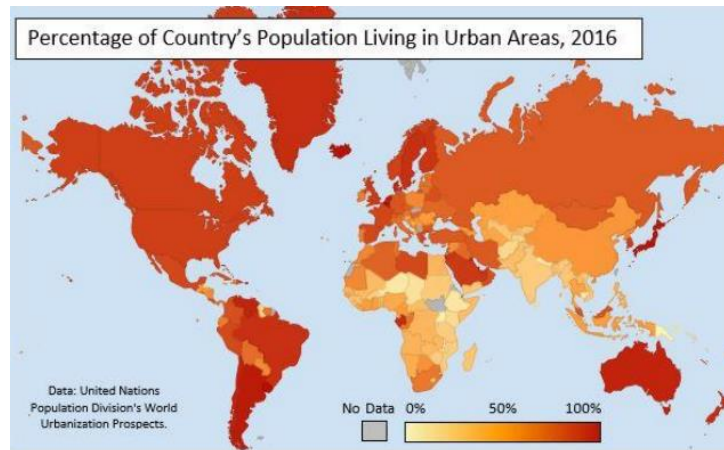
The northeast of the UK receives the most precipitation in the UK. For example, the Outer Hebrides receives the most rainfall in with over 3000 mm. However, Exmoor is an anomaly because it receives 3000 mm and is located in the southwest of the UK.



Describe the distribution of sunshine percentage in the UK



Remedy 4 - Geography



Describe the distribution of urban population

Describe the pattern of people moving out of London

