

GCSE MATHEMATICS (9-1) — EXAM PRACTICE WORKBOOK

Grade 4 Mathematics — Practice Questions

(Foundation & Higher Crossover)

Foundation & Higher Crossover Exam Practice, Calculator Badges, 2 Mixed Review Papers & Full Answer Key

- 6 Edexcel Exam-Style Questions per topic with mark allocations
- Calculator & Non-Calculator Badges across all questions
- 2 Interleaved Mixed Review Sets (Paper 1 & Paper 2/3 method selection)
- Structured Working Spaces & Full Answer Key Appendix

Student Name: _____

Class / Teacher: _____

Target Grade: _____



SCAN FOR ONLINE PRACTICE & WORKED SOLUTIONS

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Interactive Step-by-Step GCSE Mathematics Mastery

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Percentage Multipliers

EDEXCEL GCSE EXAM PRACTICE

Total: 13 marks

Percentage Multipliers — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 **Non-Calculator****(2 marks)**

Decrease £70 by 15%.

WORKING OUT SPACE

Answer:

Question 2 **Non-Calculator****(2 marks)**

Increase £160 by 30%.

WORKING OUT SPACE

Answer:

Question 3 **Calculator****(2 marks)**

Increase £340 by 4.5%.

WORKING OUT SPACE

Answer:

Question 4 **Calculator****(2 marks)**

Decrease £260 by 12.5%.

WORKING OUT SPACE

Answer:

Question 5 **Non-Calculator****(2 marks)**

Decrease £180 by 30%.

WORKING OUT SPACE

Answer:**Question 6** **Calculator****(3 marks)**

The price of a laptop is increased by 20% and then decreased by 10% in a sale.

Find the single decimal multiplier that represents the overall percentage change, and state the overall percentage increase.

WORKING OUT SPACE

Multiplier: **Overall increase:** %

NUMBER — PERCENTAGES

Compound Interest

EDEXCEL GCSE EXAM PRACTICE

Total: 15 marks

Compound Interest — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 **Calculator****(2 marks)**

£8,000 is invested at 6% compound interest for 2 years. How much is in the account at the end of the 2 years?

WORKING OUT SPACE

Answer:

Question 2 **Calculator****(2 marks)**

A car is bought for £2,000. It depreciates in value by 10% each year. How much is it worth after 5 years?

WORKING OUT SPACE

Answer:

Question 3 **Calculator****(3 marks)**

Freya deposits £10,000 for 6 years in a building society account. She earns 1.9% per annum compound interest.

Calculate the **total amount of interest** Freya will earn after 6 years. Give your answer to 2 decimal places.

WORKING OUT SPACE

Answer:

Question 4 **Calculator****(3 marks)**

Samir bought a bungalow for £280,000.

In the first year the bungalow price increased by 3.7%.

In the second year the bungalow price increased by 2.7%.

In the third year the bungalow price depreciated by 2.7%.

Work out the value of the bungalow at the end of 3 years.

Give your answer to 2 decimal places.

WORKING OUT SPACE

Answer:**Question 5** **Calculator****(3 marks)**

Alice is going to invest £4,000 for 4 years.

She can choose from two options:

Investment A: 2.8% compound interest per annum

Investment B: 3.0% simple interest per annum

Work out the **difference** in the total amount she would have at the end of 4 years between the two options.

Give your answer to 2 decimal places.

WORKING OUT SPACE

Answer:**Question 6** **Calculator****(2 marks)**

Nick bought a new car.

Each year the car depreciates in value by 17%.

Work out the number of years it takes for the car to halve in value.

WORKING OUT SPACE

Answer:

Prime Factor Trees

EDEXCEL GCSE EXAM PRACTICE

Total: 13 marks

Prime Factor Trees — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ☒ Non-Calculator

(2 marks)

Express 42 as a product of its prime factors.

WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(2 marks)

Express 180 as a product of its prime factors in index form.

WORKING OUT SPACE

Answer:

Question 3 ☒ Non-Calculator

(2 marks)

Express 150 as a product of its prime factors.

WORKING OUT SPACE

Answer:

Question 4 ☒ Non-Calculator

(2 marks)

Express 108 as a product of its prime factors in index form.

WORKING OUT SPACE

Answer:

Question 5 **Non-Calculator****(3 marks)**

- (a) Express 140 as a product of its prime factors in index form.
(b) Hence find the smallest positive integer k such that $140k$ is a square number.

WORKING OUT SPACE

(a) (b) $k =$ **Question 6** **Non-Calculator****(2 marks)**

Express 80 as a product of its prime factors in index form.

WORKING OUT SPACE

Answer:

HCF & LCM

EDEXCEL GCSE EXAM PRACTICE**Total: 13 marks**

HCF & LCM — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ☒ **Non-Calculator****(2 marks)**

Find the Highest Common Factor (HCF) of 24 and 15.

WORKING OUT SPACE

Answer:**Question 2** ☒ **Non-Calculator****(2 marks)**

Given that $A = 3^2 \times 5 \times 13^2$ and $B = 3^4 \times 13$

Find the Highest Common Factor (HCF) of A and B.

WORKING OUT SPACE

Answer:**Question 3** ☒ **Non-Calculator****(2 marks)**

Find the Lowest Common Multiple (LCM) of 8, 12 and 20.

WORKING OUT SPACE

Answer:

Question 4 **Non-Calculator****(2 marks)**

Given that $A = 2^3 \times 3^2 \times 5$ and $B = 2^2 \times 3 \times 7$, find the Lowest Common Multiple (LCM) of A and B as an ordinary number.

WORKING OUT SPACE

Answer:**Question 5** **Non-Calculator****(2 marks)**

Sensor 1 beeps every 5 seconds.

Sensor 2 beeps every 6 seconds.

Sensor 3 beeps every 7 seconds.

All three sensors beep simultaneously.

Work out how long it will take for all three sensors to beep together again.

WORKING OUT SPACE

Answer:**Question 6** **Non-Calculator****(3 marks)**

Elena selects two integers greater than 10.

She states:

"The highest common factor (HCF) of my two numbers is 8.

The lowest common multiple (LCM) of my two numbers is 168."

Write down the two numbers.

WORKING OUT SPACE

Answer:

Laws of Indices

EDEXCEL GCSE EXAM PRACTICE

Total: 9 marks

Laws of Indices — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ☒ Non-Calculator

(1 mark)

Simplify p^1

WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(1 mark)

Evaluate 63^0

WORKING OUT SPACE

Answer:

Question 3 ☒ Non-Calculator

(1 mark)

Simplify $a^6 \times a^8$

WORKING OUT SPACE

Answer:

Question 4 ☒ Non-Calculator

(1 mark)

Simplify $(p^3)^5$

WORKING OUT SPACE

Answer:

Question 5 Non-Calculator**(2 marks)**

Simplify fully $\frac{y^5 \times y^7}{y^4}$

WORKING OUT SPACE

Answer:

Question 6 Non-Calculator**(3 marks)**

Given that $\frac{(x^4)^3}{x^k} = x^5$, find the value of k .

WORKING OUT SPACE

Answer:

Indices with Numbers & Letters

EDEXCEL GCSE EXAM PRACTICE

Total: 11 marks

Indices with Numbers & Letters — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ☒ Non-Calculator

(2 marks)

Simplify $7b^4 \times 4b^2$

WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(1 mark)

Evaluate $9b^0$

WORKING OUT SPACE

Answer:

Question 3 ☒ Non-Calculator

(2 marks)

Simplify $(2y^3)^3$

WORKING OUT SPACE

Answer:

Question 4 ☒ Non-Calculator

(2 marks)

Simplify $\frac{16a^{12}}{2a^3}$

WORKING OUT SPACE

Answer:

Question 5 Non-Calculator**(2 marks)**

Simplify fully $\frac{6y^4 \times 5y^7}{3y^3}$

WORKING OUT SPACE

Answer:

Question 6 Non-Calculator**(2 marks)**

Simplify fully $\frac{(2m^3)^4}{4m^5}$

WORKING OUT SPACE

Answer:

Brackets (Single)

EDEXCEL GCSE EXAM PRACTICE

Total: 13 marks

Brackets (Single) — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ☒ Non-Calculator

(2 marks)

Expand $2(4n - 9)$

WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(2 marks)

Expand and simplify $5(2x + 3) - 2(3x - 4)$

WORKING OUT SPACE

Answer:

Question 3 ☒ Non-Calculator

(2 marks)

Factorise completely: $15y - 6$

WORKING OUT SPACE

Answer:

Question 4 ☒ Non-Calculator

(2 marks)

Expand $n(n - q)$

WORKING OUT SPACE

Answer:

Question 5 ✎ Non-Calculator**(2 marks)**Factorise fully $8x^2 - 20xy$

WORKING OUT SPACE

Answer:**Question 6** ✎ Non-Calculator**(3 marks)**Solve $5(2c - 3) = 35$

WORKING OUT SPACE

Answer:

Forming & Solving Equations

EDEXCEL GCSE EXAM PRACTICE

Total: 14 marks

Forming & Solving Equations — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ☒ Non-Calculator

(2 marks)

Solve $5x + 1 = 4x + 8$

WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(2 marks)

Solve $4x - 7 = 23 - 2x$

WORKING OUT SPACE

Answer:

Question 3 ☒ Non-Calculator

(2 marks)

Declan is x years old.

Freya is 7 years older than Declan.

Callum is 4 years younger than Declan.

The sum of their ages is 39.

Form an equation in x and solve it to find Declan's age.

WORKING OUT SPACE

Answer:

Question 4 Non-Calculator**(2 marks)**

A sketchbook costs $\pounds x$.

A paint set costs $\pounds 15$.

Kieran bought 2 sketchbooks and 2 paint sets.

The total price was $\pounds 60$.

Find the price of a sketchbook.

WORKING OUT SPACE

Answer:

Question 5 Non-Calculator**(2 marks)**

The angles around a point are given as 90° , $2x^\circ$ and $3x^\circ$.

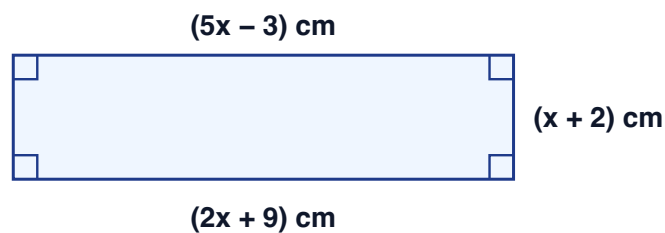
Find the value of x .

WORKING OUT SPACE

Answer:

Question 6 Non-Calculator**(4 marks)**

The diagram shows a rectangle with top side $(5x - 3)$ cm, bottom side $(2x + 9)$ cm and width $(x + 2)$ cm.



Work out the numerical **perimeter** of the rectangle in cm.

WORKING OUT SPACE

Answer:

ALGEBRA — EQUATIONS & SEQUENCES

Linear Inequalities

EDEXCEL GCSE EXAM PRACTICE

Total: 14 marks

Linear Inequalities — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ☒ Non-Calculator

(2 marks)

Write down the inequality shown on the number line below for x :



WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(2 marks)

Solve $2y + 7 \geq 1$

WORKING OUT SPACE

Answer:

Question 3 ☒ Non-Calculator

(2 marks)

$-14 < 3y < 11$ where y is an integer.
Write down all the possible values of y .

WORKING OUT SPACE

Answer:

Question 4 **Non-Calculator****(3 marks)**Solve $6x + 5 < 2x + 29$

WORKING OUT SPACE

Answer:

Question 5 **Non-Calculator****(2 marks)** $-4 < 3y + 5 < 16$ where y is an integer.Write down all the possible values of y .

WORKING OUT SPACE

Answer:

Question 6 **Non-Calculator****(3 marks)**Solve $25 - 3x \geq 7$

WORKING OUT SPACE

Answer:

Linear & Special Sequences

EDEXCEL GCSE EXAM PRACTICE

Total: 11 marks

Linear & Special Sequences — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ☒ Non-Calculator

(2 marks)

Find the n th term of the sequence: $1, -2, -5, -8, \dots$

WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(2 marks)

Here are the first five terms of a Fibonacci sequence:

2, 2, 4, 6, 10

Write down the next two terms in the sequence.

WORKING OUT SPACE

Answer:

Question 3 ☒ Non-Calculator

(2 marks)

The n th term of a sequence is $n^2 + 4$.

Is 32 a term in this sequence?

WORKING OUT SPACE

Answer:

Question 4 **Non-Calculator****(1 mark)**

Here are the first four terms of a number sequence.

4 15 48 147

The rule to continue the sequence is:

multiply the previous term by 3 and then add 3

Work out the 5th term of this sequence.

WORKING OUT SPACE

Answer:

Question 5 **Non-Calculator****(2 marks)**

The first term in a sequence is 12. The term-to-term rule is add 4.

Is 46 a term in the sequence?

WORKING OUT SPACE

Answer:

Question 6 **Non-Calculator****(2 marks)**

Here are the first five terms of a sequence.

22 20 18 16 14

Find the first negative term in the sequence.

WORKING OUT SPACE

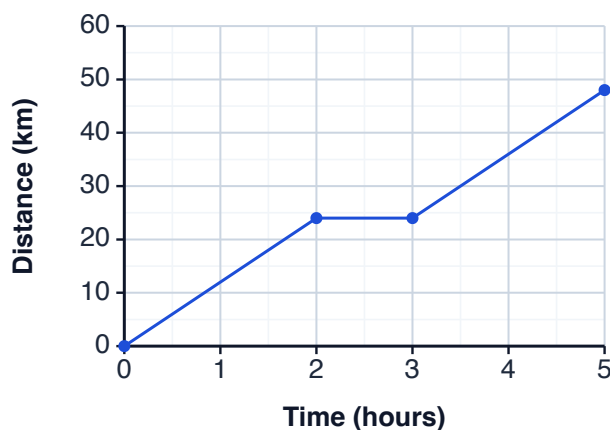
Answer:

Real Life Graphs

EDEXCEL GCSE EXAM PRACTICE**Total: 13 marks**

Real Life Graphs — Practice Questions

Check the *Calculator* or *Non-Calculator* label on each question before you start. Show your working clearly in the box.

Question 1 ☒ **Non-Calculator****(2 marks)**

The distance-time graph shows the journey of a cyclist.

Work out the speed of the cyclist during the first **2 hours** in km/h.

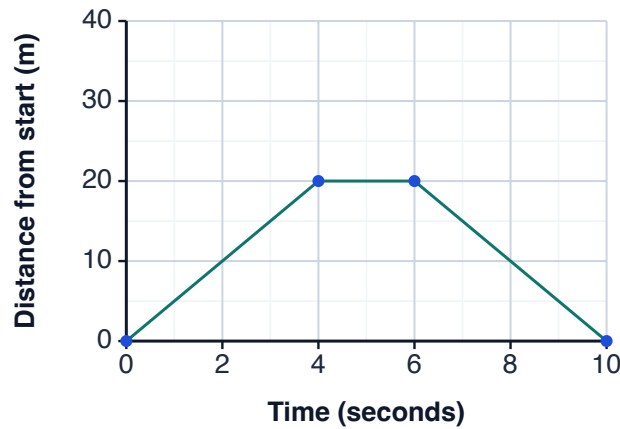
WORKING OUT SPACE

Answer:

Question 2

 Non-Calculator

(2 marks)



The distance-time graph shows the journey of a runner that travels away from the start, stops for a rest, and then returns to the start.

Calculate the speed of the runner on the **return journey** (between 6 seconds and 10 seconds) in m/s.

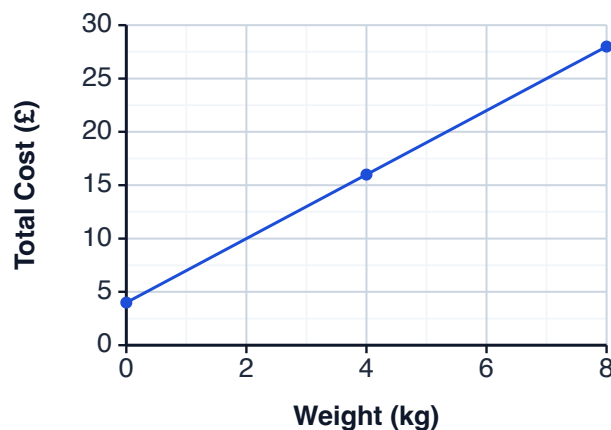
WORKING OUT SPACE

Answer:

Question 3

 Non-Calculator

(2 marks)

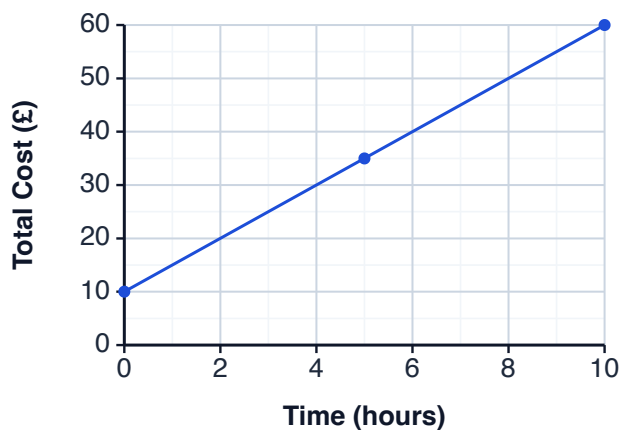


The graph shows the total cost (£) charged by a parcel courier made up of a fixed charge plus a charge per kg.

Use the graph to work out the charge **per kg** in £.

WORKING OUT SPACE

Answer:

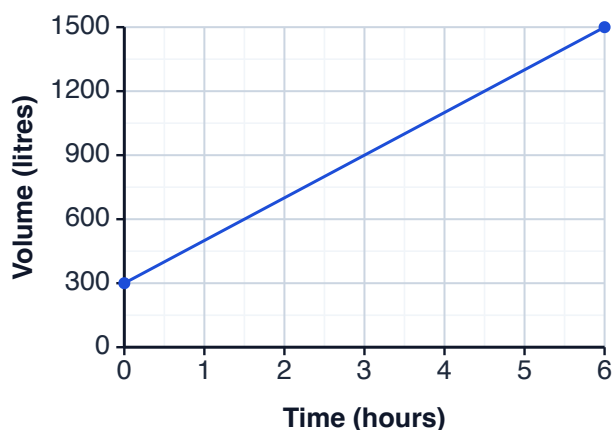
Question 4 Non-Calculator**(3 marks)**

The graph shows the total cost (£) charged by a dog groomer.

- (a)** Write down the fixed call-out / booking charge in £.
(b) Work out the total charge for a 4-hour grooming session.

WORKING OUT SPACE

(a) £ (b) £

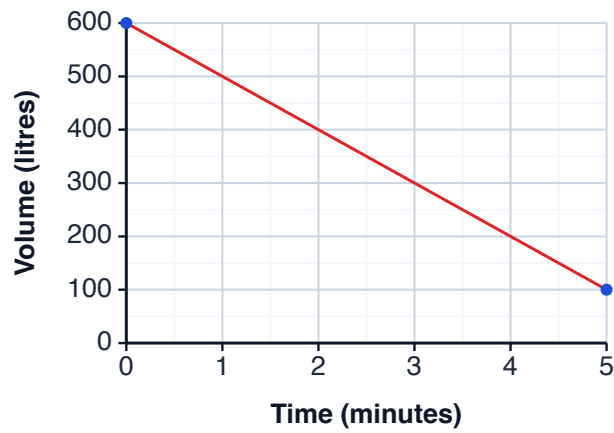
Question 5 Non-Calculator**(2 marks)**

The graph shows the volume of water (in litres) in a storage tank as it is being filled over 6 hours.

Calculate the **rate of flow** of water into the tank in litres per hour.

WORKING OUT SPACE

Answer:

Question 6 **Non-Calculator****(2 marks)**

The graph shows the volume of water (in litres) remaining in a tank as it drains.

Work out the **rate at which water is draining** from the tank in litres per minute.

WORKING OUT SPACE

Answer:

Angles in Parallel Lines

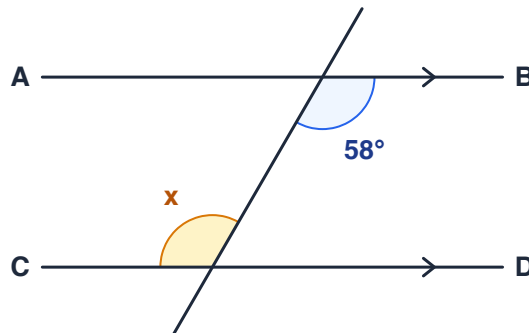
EDEXCEL GCSE EXAM PRACTICE**Total: 12 marks**

Angles in Parallel Lines — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ☒ **Non-Calculator****(1 mark)**

Straight lines AB and CD are parallel.



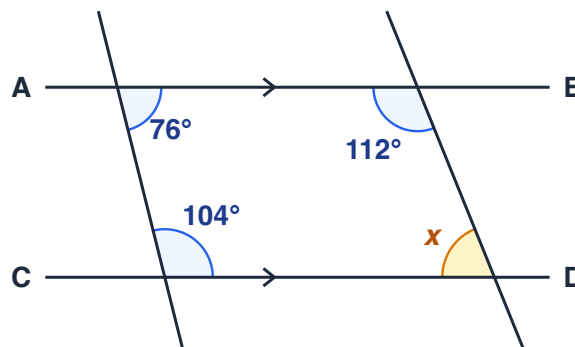
Work out the size of angle x .

WORKING OUT SPACE

Answer:

Question 2 ☒ **Non-Calculator****(2 marks)**

Two straight transversals cross parallel lines AB and CD .



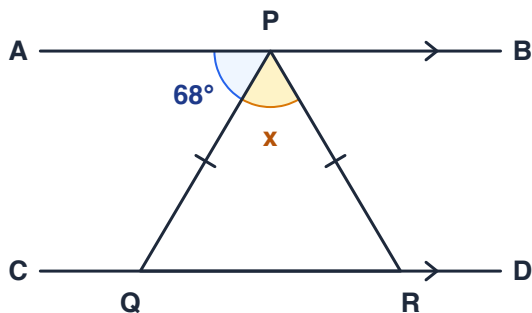
Work out the size of angle x .

WORKING OUT SPACE

Answer:

Question 3 ✎ Non-Calculator**(3 marks)**

Line APB is parallel to line $CQRD$, and $PQ = PR$.
 Angle $APQ = 68^\circ$.



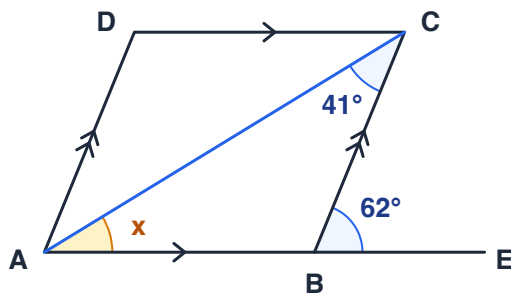
Work out the size of angle QPR (x).

WORKING OUT SPACE

Answer:

Question 4 ✎ Non-Calculator**(2 marks)**

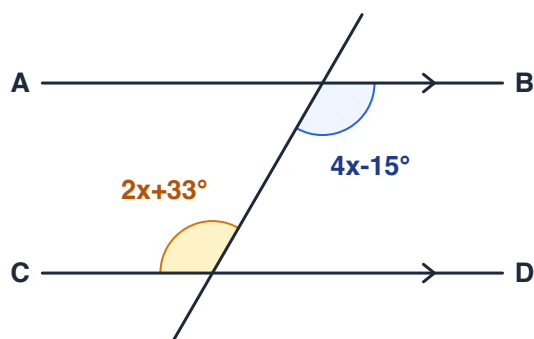
$ABCD$ is a parallelogram and ABE is a straight line.
 Angle $CBE = 62^\circ$ and angle $ACB = 41^\circ$.



Work out the size of angle CAB (x).

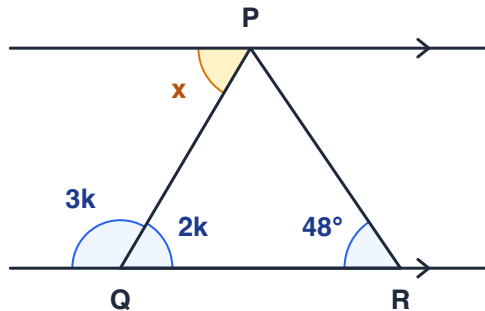
WORKING OUT SPACE

Answer:

Question 5 ✎ Non-Calculator**(2 marks)**Lines AB and CD are parallel.Form an equation and work out the value of x .

WORKING OUT SPACE

Answer:

Question 6 ✎ Non-Calculator**(2 marks)**The two horizontal lines are parallel. The angles at Q on the bottom line are in the ratio $3 : 2$.Work out the size of angle x .

WORKING OUT SPACE

Answer:

Angles in Polygons

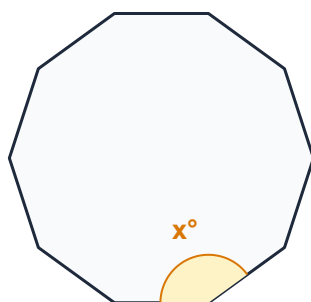
EDEXCEL GCSE EXAM PRACTICE**Total: 16 marks**

Angles in Polygons — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ✎ Non-Calculator**(2 marks)**

The diagram shows a regular decagon (10 sides).
Work out the size of each interior angle x° .

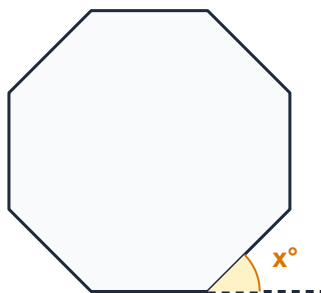


WORKING OUT SPACE

Answer:

Question 2 Non-Calculator**(2 marks)**

The diagram shows a regular octagon (8 sides) with one side extended. Work out the size of the exterior angle x° .

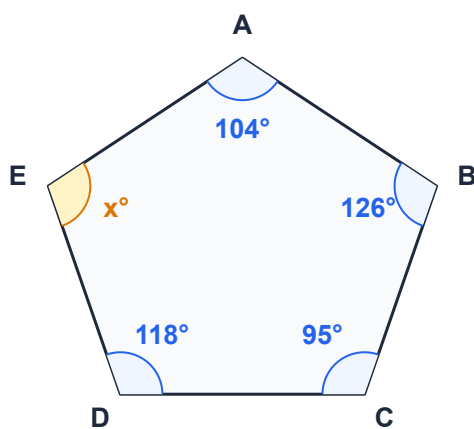


WORKING OUT SPACE

Answer:

Question 3 Non-Calculator**(3 marks)**

Work out the value of x in the irregular pentagon $ABCDE$.

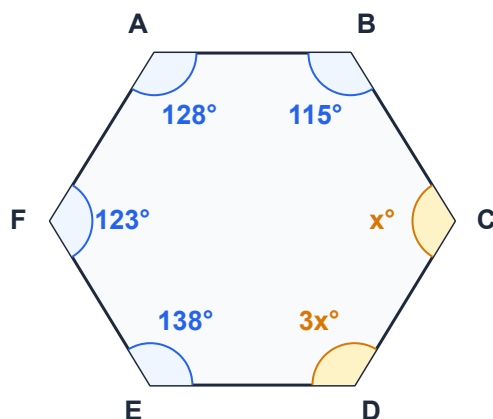


WORKING OUT SPACE

Answer:

Question 4 ✎ Non-Calculator**(3 marks)**

In the irregular hexagon $ABCDEF$, angle D is 3 times angle C ($\angle C = x^\circ$ and $\angle D = 3x^\circ$).
Work out the value of x .

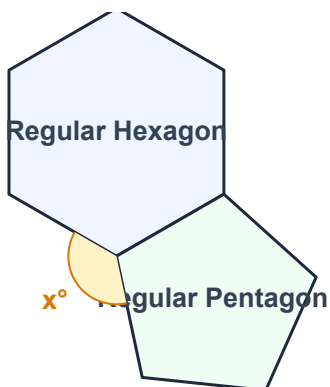


WORKING OUT SPACE

Answer:

Question 5 ✎ Non-Calculator**(3 marks)**

A regular hexagon and a regular pentagon share a side and meet at a vertex.
Work out the size of the angle marked x° .



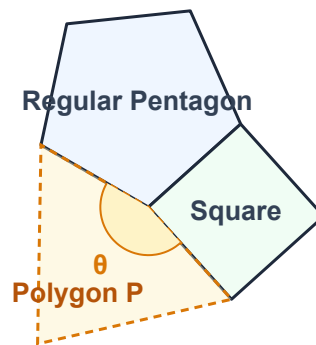
WORKING OUT SPACE

Answer:

Question 6 **Non-Calculator****(3 marks)**

A regular pentagon and a square share sides with a third regular polygon P , meeting at a point with no gaps.

Work out the number of sides of regular polygon P .



WORKING OUT SPACE

Answer:

Bearings

EDEXCEL GCSE EXAM PRACTICE

Total: 13 marks

Bearings — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

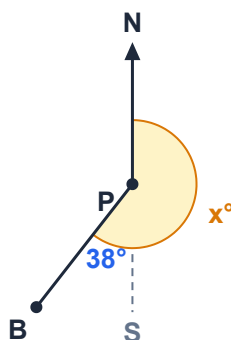
Question 1 ✎ Non-Calculator

(2 marks)

The diagram shows the position of point B from point P .

The angle between due South and PB is 38° .

Work out the three-figure bearing of B from P .



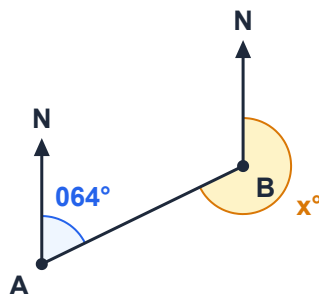
WORKING OUT SPACE

Answer:

Question 2 ✎ Non-Calculator**(2 marks)**

The bearing of B from A is 064° .

Work out the three-figure bearing of A from B .



WORKING OUT SPACE

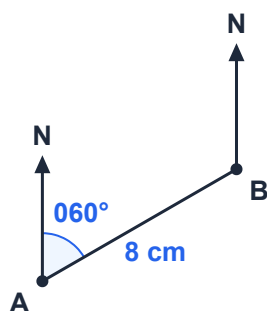
Answer:

Question 3 ✎ Non-Calculator**(2 marks)**

A scale drawing uses a scale of 1 cm represents 4.5 km.

On the drawing, the distance between Harbour A and Reef B is 8 cm.

Work out the actual distance between Harbour A and Reef B in km.

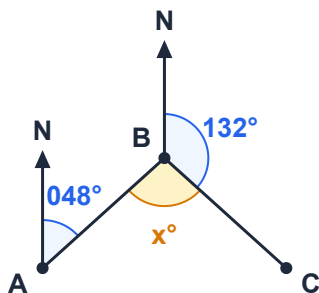


WORKING OUT SPACE

Answer:

Question 4 ✎ Non-Calculator**(3 marks)**

A boat sails from A to B on a bearing of 048° , and then from B to C on a bearing of 132° .
Work out the size of the interior angle ABC (marked x°).

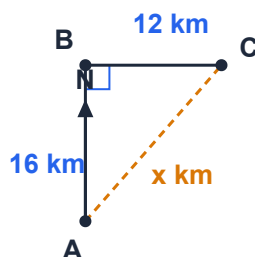


WORKING OUT SPACE

Answer:

Question 5 🧮 Calculator**(2 marks)**

A trawler sails 16 km due North from harbour A to point B , and then 12 km due East from B to C .
Work out the direct distance AC in km.

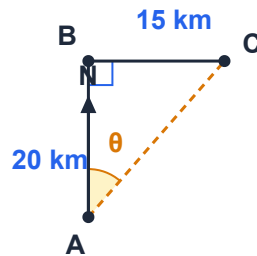


WORKING OUT SPACE

Answer:

Question 6 **Calculator****(2 marks)**

A drone flies 20 km due North from A to B , and then 15 km due East from B to C .
Work out the three-figure bearing of C from A , correct to the nearest degree.



WORKING OUT SPACE

Answer:

Translations, Reflections & Rotations

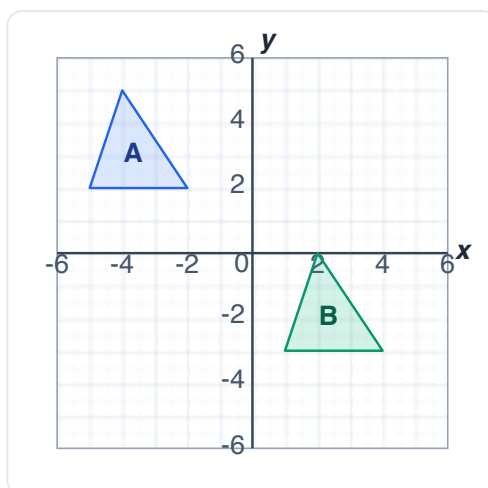
EDEXCEL GCSE EXAM PRACTICE**Total: 13 marks**

Translations, Reflections & Rotations — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ☒ **Non-Calculator****(2 marks)**

Shape A and Shape B are drawn on the coordinate grid below.



Shape A is translated onto Shape B by the column vector $\begin{pmatrix} p \\ q \end{pmatrix}$.

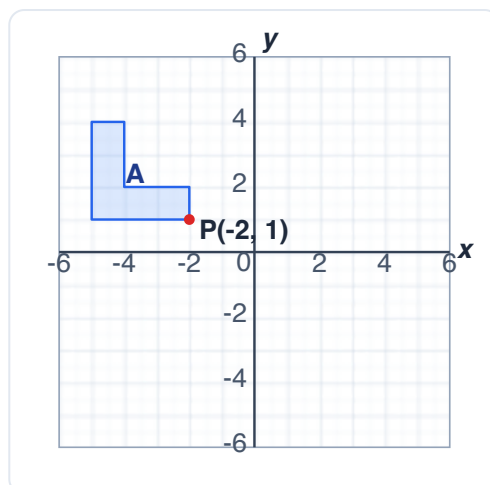
Find the values of p and q , giving your answer as an ordered pair (p, q) .

WORKING OUT SPACE

Answer:

Question 2 **Non-Calculator****(2 marks)**

L-shape A is drawn on the coordinate grid below with vertex $P(-2, 1)$.



L-shape A is translated by the column vector $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$ to give L-shape B .

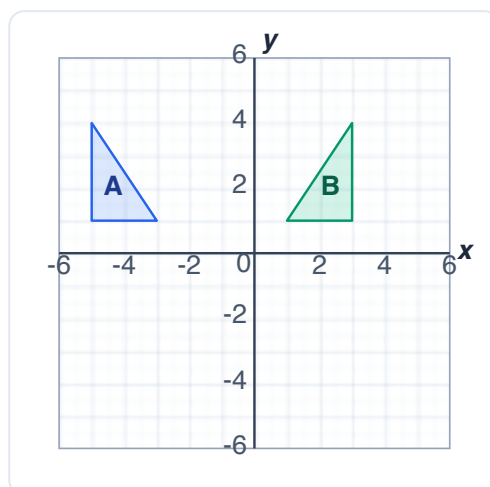
Find the coordinates of the image of vertex P .

WORKING OUT SPACE

Answer:

Question 3 **Non-Calculator****(2 marks)**

Shape A and Shape B are drawn on the coordinate grid below.



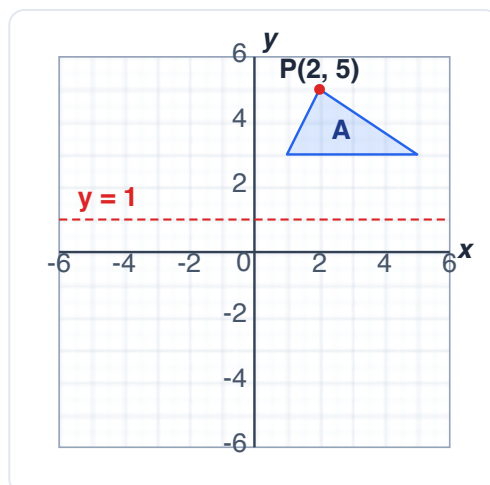
Describe fully the single transformation that maps Shape A onto Shape B .

WORKING OUT SPACE

Answer:

Question 4 ✎ Non-Calculator**(2 marks)**

Triangle A is drawn on the coordinate grid below with vertex $P(2, 5)$.



Triangle A is reflected in the line $y = 1$.

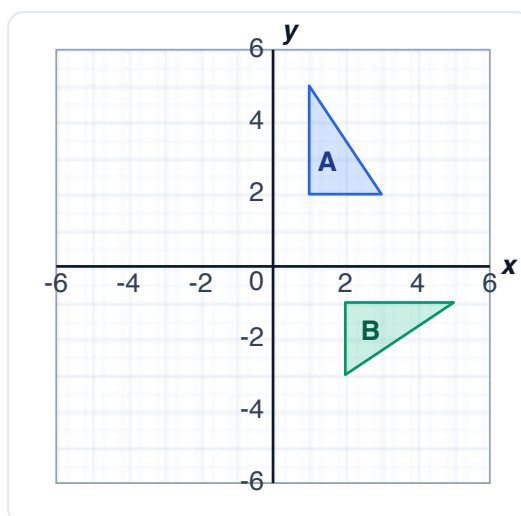
Find the coordinates of the image of vertex P .

WORKING OUT SPACE

Answer:

Question 5 ✎ Non-Calculator**(3 marks)**

Shape A and Shape B are drawn on the coordinate grid below.



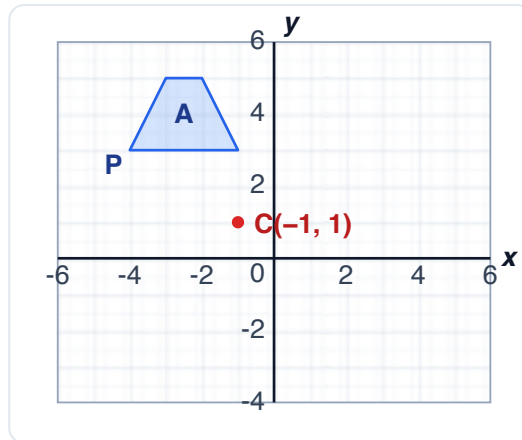
Describe fully the single transformation that maps Shape A onto Shape B .

WORKING OUT SPACE

Answer:

Question 6 **Non-Calculator****(2 marks)**

Trapezium A has vertex $P(-4, 3)$.



Trapezium A is rotated 180° about the point $C(-1, 1)$.
Find the coordinates of the image of vertex P .

WORKING OUT SPACE

Answer:

Constructions & Loci

EDEXCEL GCSE EXAM PRACTICE

Total: 15 marks

Constructions & Loci — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ✎ Non-Calculator

(2 marks)

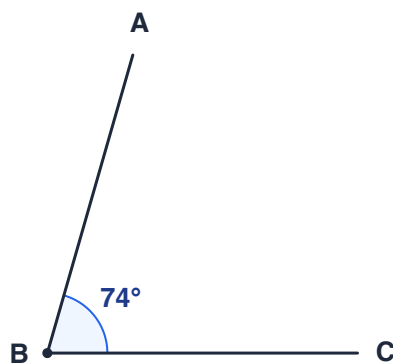
- (a) Using a ruler and a pair of compasses only, construct the perpendicular bisector of the line segment AB of length 9.6 cm.



- (b) State the distance from A to the midpoint M where your bisector crosses AB .

WORKING OUT SPACE

(b) $AM = \dots\dots\dots$ cm

Question 2 ✎ Non-Calculator**(2 marks)****(a)** Using a ruler and a pair of compasses only, construct the bisector of angle $ABC = 74^\circ$.**(b)** Work out the size of each of the two angles formed by your angle bisector.

WORKING OUT SPACE

(b) °**Question 3** ✎ Non-Calculator**(2 marks)**The base AB of triangle ABC has been drawn with length 9 cm.**(a)** Using a ruler and a pair of compasses only, construct triangle ABC with $AC = 7$ cm and $BC = 6$ cm.**(b)** Work out the perimeter of triangle ABC .

WORKING OUT SPACE

(b) cm

Question 4 ✎ Non-Calculator**(2 marks)**

(a) Using a ruler and a pair of compasses only, construct an angle of 60° at point A on the line segment AB (where $AB = 8$ cm) by using a compass radius of 5 cm to mark X on AB and C above AB .



(b) Join X to C to form equilateral triangle AXC , and state its perimeter.

WORKING OUT SPACE

(b) cm

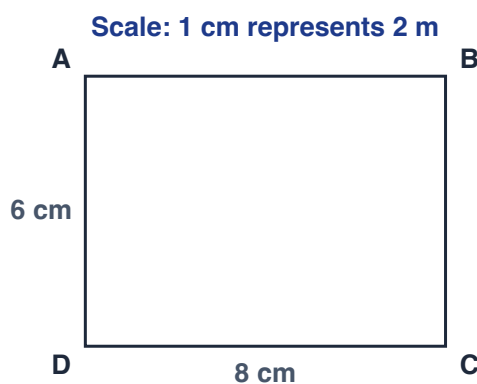
Question 5 ✎ Non-Calculator**(3 marks)**

The scale drawing shows a rectangular garden $ABCD$ measuring 8 cm by 6 cm, where 1 cm represents 2 m.

A tree is to be planted in the garden so that it is:

- closer to hedge AB than hedge DC , and
- less than 6 m from corner A .

(a) Construct and shade the region where the tree can be planted.



(b) State the compass radius, in cm, needed on the scale drawing for the arc centred at A .

WORKING OUT SPACE

(b) cm

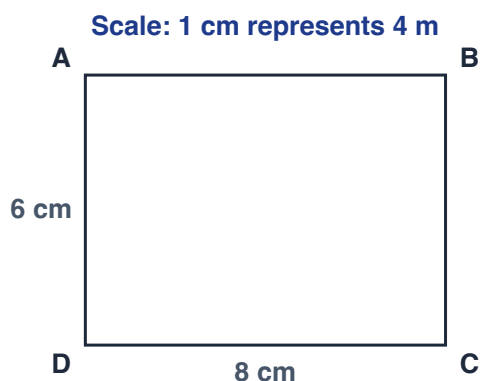
Question 6 Non-Calculator**(4 marks)**

The scale drawing shows a rectangular field $ABCD$ measuring 8 cm by 6 cm, where 1 cm represents 4 m.

A water trough must be placed where it is:

- closer to fence AB than fence AD , and
- within 16 m of corner A .

(a) Using a ruler and compasses, construct and shade the acceptable region.



(b) State the compass radius, in cm, needed on the scale drawing for the arc centred at A .

WORKING OUT SPACE

(b) cm

Pythagoras' Theorem

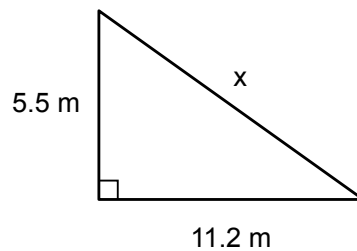
EDEXCEL GCSE EXAM PRACTICE**Total: 18 marks**

Pythagoras' Theorem — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 **Calculator****(3 marks)**

Calculate the length of x . Give your answer to 1 decimal place if needed.

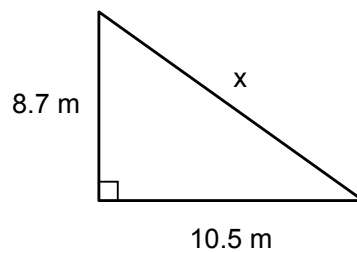


WORKING OUT SPACE

Answer:

Question 2 **Calculator****(3 marks)**

Calculate the length of x . Give your answer to 1 decimal place if needed.

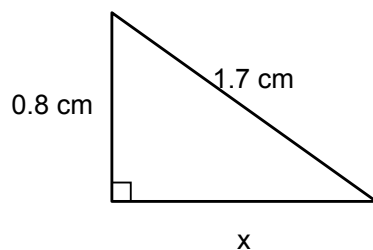


WORKING OUT SPACE

Answer:

Question 3 **Calculator****(3 marks)**

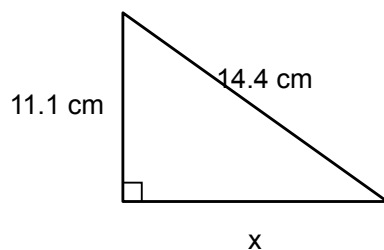
Calculate the length of x . Give your answer to 1 decimal place if needed.



WORKING OUT SPACE

Answer:**Question 4** **Calculator****(3 marks)**

Calculate the length of x . Give your answer to 1 decimal place if needed.



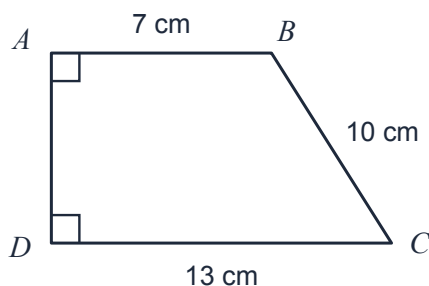
WORKING OUT SPACE

Answer:

Question 5 **Non-Calculator****(3 marks)**

$ABCD$ is a right-angled trapezium with parallel sides $AB = 7$ cm and $DC = 13$ cm, and slanted side $BC = 10$ cm.

Calculate the **area** of the trapezium.



WORKING OUT SPACE

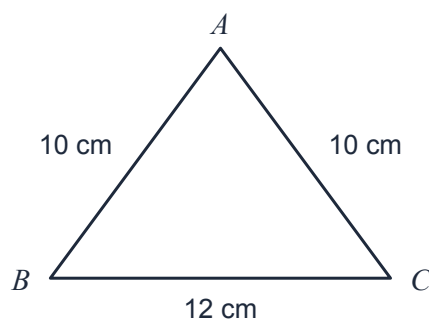
Answer:

Question 6 **Non-Calculator****(3 marks)**

ABC is an isosceles triangle with $AB = AC = 10$ cm and $BC = 12$ cm.

Calculate the **area** of triangle ABC .

Give your answer correct to 1 decimal place if needed.



WORKING OUT SPACE

Answer:

Surface Area

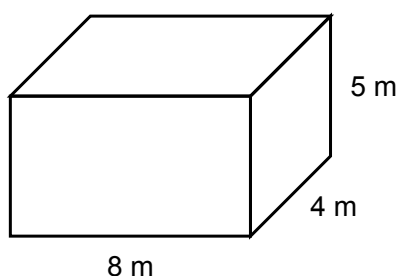
EDEXCEL GCSE EXAM PRACTICE**Total: 22 marks**

Surface Area — Practice Questions

Check the *Calculator* or *Non-Calculator* label on each question before you start. Show your working clearly in the box.

Question 1 Non-Calculator**(3 marks)**

The diagram shows a cuboid.
Find the total surface area of the cuboid.

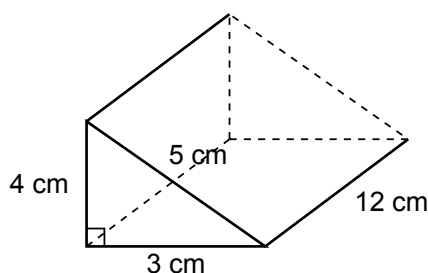


WORKING OUT SPACE

Answer:

Question 2 Non-Calculator**(3 marks)**

The diagram shows a triangular prism.
Find the total surface area of the triangular prism.



WORKING OUT SPACE

Answer:

Question 3 **Calculator****(4 marks)**

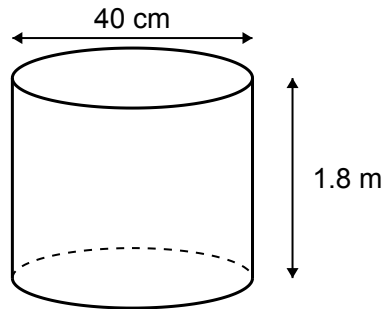
The diagram shows a cylindrical tank.

The tank has a top and a bottom.

4 of these tanks are going to be painted.

Each pot of paint can cover 3 m^2 .

How many pots of paint are needed to paint the 4 tanks?



WORKING OUT SPACE

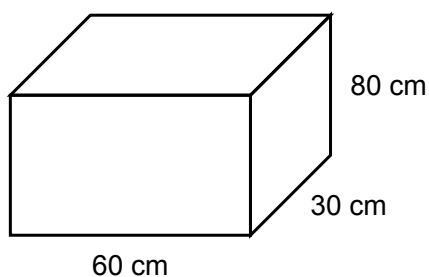
Answer:**Question 4** **Calculator****(4 marks)**

The diagram shows a box.

4 of these boxes are going to be painted.

Each pot of paint can cover 5 m^2 .

How many pots of paint are needed to paint the 4 boxes?



WORKING OUT SPACE

Answer:

Question 5 **Non-Calculator****(4 marks)**

The diagram shows a prism. The cross-section of the prism is an isosceles trapezium.

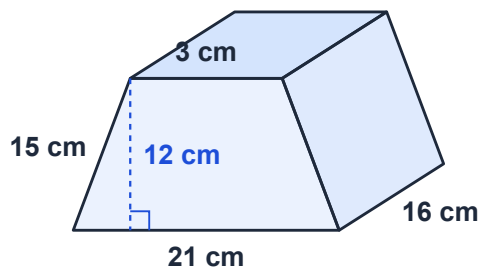
The parallel sides of the trapezium are 3 cm and 21 cm.

The perpendicular height of the trapezium is 12 cm.

The slant edges of the trapezium are both 15 cm.

The length of the prism is 16 cm.

Calculate the total surface area of the prism.

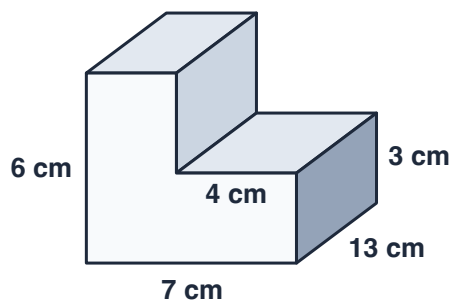


WORKING OUT SPACE

Answer:

Question 6 **Non-Calculator****(4 marks)**

The diagram shows an L-shaped prism.



The cross-section is an L-shape with the following dimensions:

Total width along the bottom = 7 cm

Total height on the left = 6 cm

The height of the right-most edge = 3 cm

The width of the horizontal cut-out step = 4 cm

The length of the prism is 13 cm.

Calculate the total surface area of the prism.

WORKING OUT SPACE

Answer:

Volume of Prisms

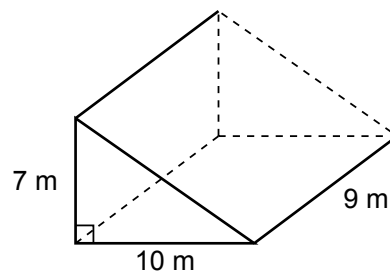
EDEXCEL GCSE EXAM PRACTICE**Total: 20 marks**

Volume of Prisms — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ✎ Non-Calculator**(3 marks)**

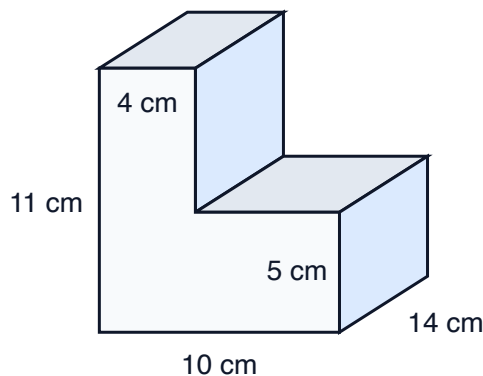
The diagram shows a triangular prism.
The cross-section of the prism is a right angled triangle.
Calculate the volume of the prism.



WORKING OUT SPACE

Answer:**Question 2** ✎ Non-Calculator**(3 marks)**

The diagram shows a prism.
Work out the volume of the prism.



WORKING OUT SPACE

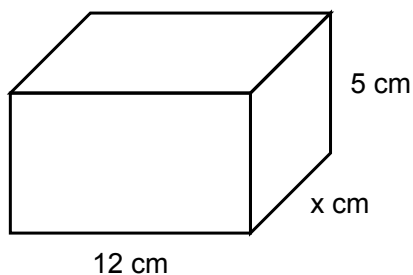
Answer:

Question 3 Non-Calculator**(3 marks)**

The diagram shows a cuboid.

The volume of the cuboid is 360 cm^3 .

Calculate the value of x .



WORKING OUT SPACE

Answer:

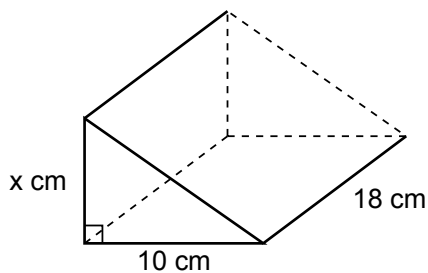
Question 4 Non-Calculator**(3 marks)**

The diagram shows a triangular prism.

The cross-section of the prism is a right angled triangle.

The volume of the prism is 630 cm^3 .

Calculate the value of x .

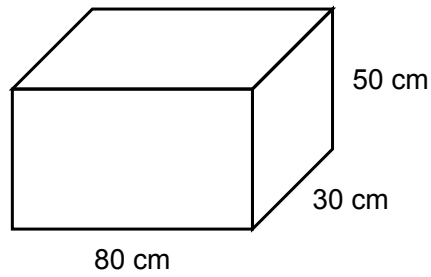


WORKING OUT SPACE

Answer:

Question 5 **Non-Calculator****(4 marks)**

The diagram shows an empty garden water trough.



Marcus uses a watering can to fill the trough.
Each full watering can holds 6 litres of water.

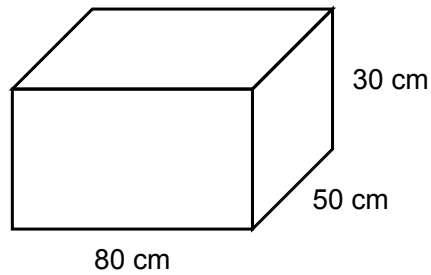
How many full watering cans are needed to completely fill the trough?

WORKING OUT SPACE

Answer:

Question 6 **Non-Calculator****(4 marks)**

Tariq is loading storage crates into a delivery lorry.
Each crate is a cuboid measuring 80 cm by 50 cm by 30 cm.



The cargo bay of the lorry is in the shape of a cuboid with:
length 4 m
width 3 m
height 3 m

Work out the maximum number of crates Tariq can pack into the lorry.

WORKING OUT SPACE

Answer:

Cylinders

EDEXCEL GCSE EXAM PRACTICE

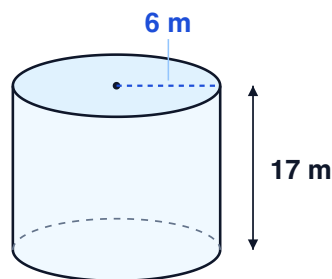
Total: 21 marks

Cylinders — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 **Calculator****(3 marks)**

A solid cylinder has a radius of 6 m and a height of 17 m.
Work out the total surface area of the cylinder.
Give your answer correct to 1 decimal place.

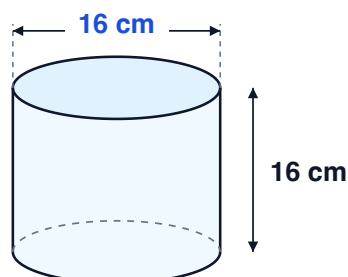


WORKING OUT SPACE

Answer:

Question 2 **Calculator****(3 marks)**

A cylinder has a diameter of 16 cm and a height of 16 cm.
Work out the volume of the cylinder.
Give your answer correct to 3 significant figures.

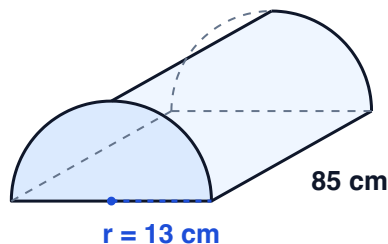


WORKING OUT SPACE

Answer:

Question 3 **Calculator****(3 marks)**

A solid cylinder is cut in half to form a semi-cylinder with a radius of 13 cm and a length of 85 cm.
Work out the volume of the semi-cylinder.
Give your answer correct to 3 significant figures.

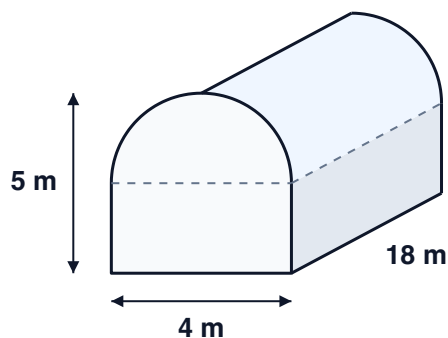


WORKING OUT SPACE

Answer:

Question 4 **Calculator****(4 marks)**

A solid is formed by placing a half cylinder on a rectangular prism.
The solid has a width of 4 m, a total height of 5 m and a length of 18 m.
Work out the volume of the solid.
Give your answer correct to 3 significant figures.

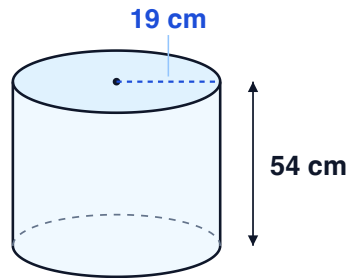


WORKING OUT SPACE

Answer:

Question 5 **Calculator****(4 marks)**

The diagram shows an empty cylindrical water butt with a radius of 19 cm and a height of 54 cm. Rainwater is pumped into the butt at a steady rate of 1.8 litres per minute. Work out how many minutes it takes to fill the water butt completely. Give your answer to the nearest minute.

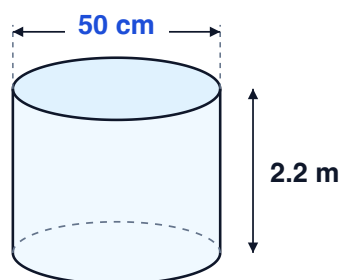


WORKING OUT SPACE

Answer:

Question 6 **Calculator****(4 marks)**

The diagram shows a sealed cylindrical metal bollard. The entire exterior surface (including both circular ends) of 8 identical bollards is to be coated with marine paint. Each bollard has a diameter of 50 cm and a height of 2.2 m. A single can of marine paint covers 6 m^2 . Calculate how many cans of paint are required to coat the 8 bollards.



WORKING OUT SPACE

Answer:

Averages from Tables

EDEXCEL GCSE EXAM PRACTICE

Total: 14 marks

Averages from Tables — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 Non-Calculator

(2 marks)

The table shows information about the number of defects per batch in a factory.

Defects	0	1	2	3	4	5
Frequency	6	9	18	11	4	2

- (a) Write down the mode.
 (b) Work out the median number of defects.

WORKING OUT SPACE

(a) Mode: (b) Median:

Question 2 Non-Calculator

(3 marks)

The table shows the number of pets owned by each of 30 students.

Number of pets	0	1	2	3
Frequency	7	11	8	f

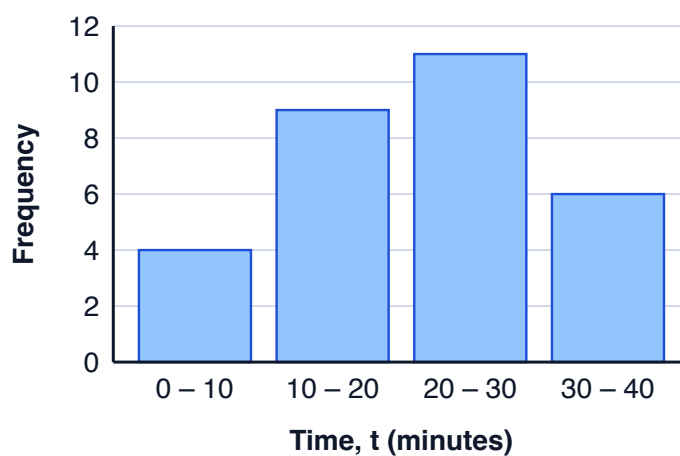
- (a) Work out the value of f .
 (b) Work out the mean number of pets per student.

WORKING OUT SPACE

(a) $f =$ (b) Mean:

Question 3 **Calculator****(3 marks)**

The bar chart shows the times, t minutes, taken by 30 students to travel to school.



Work out an estimate for the mean time taken.

WORKING OUT SPACE

Answer:

Question 4 **Calculator****(3 marks)**

The table shows the time taken (t minutes) for 160 runners to complete a charity race.

Time t (minutes)	Frequency
$0 < t \leq 20$	18
$20 < t \leq 40$	52
$40 < t \leq 60$	34
$60 < t \leq 80$	36
$80 < t \leq 100$	20

Work out an **estimate for the mean** time taken.

WORKING OUT SPACE

Answer:

Question 5 **Non-Calculator****(1 mark)**

The table shows the time taken (t minutes) for 160 runners to complete a charity race.

Time t (minutes)	Frequency
$0 < t \leq 20$	18
$20 < t \leq 40$	52
$40 < t \leq 60$	34
$60 < t \leq 80$	36
$80 < t \leq 100$	20

Write down the **modal class**.

WORKING OUT SPACE

Answer:

Question 6 **Non-Calculator****(2 marks)**

The table shows the time taken (t minutes) for 160 runners to complete a charity race.

Time t (minutes)	Frequency
$0 < t \leq 20$	18
$20 < t \leq 40$	52
$40 < t \leq 60$	34
$60 < t \leq 80$	36
$80 < t \leq 100$	20

Which class interval contains the **median**?

WORKING OUT SPACE

Answer:

Relative Frequency

EDEXCEL GCSE EXAM PRACTICE

Total: 17 marks

Relative Frequency — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 **Non-Calculator****(2 marks)**

The probability that a biased dice will land on a 4 is 0.33.
The dice is going to be rolled 500 times.

Work out an estimate for the number of times the dice will land on 4.

WORKING OUT SPACE

Answer:

Question 2 **Non-Calculator****(3 marks)**

Tom rolls a biased dice 80 times. The table shows his results.

Score	1	2	3	4	5	6
Frequency	10	12	8	20	14	16

- (a) Write down the relative frequency of rolling a 4.
(b) Estimate how many times the dice will land on 4 in 300 rolls.

WORKING OUT SPACE

(a) (b)

Question 3 **Non-Calculator****(3 marks)**

A biased spinner can land on Black, Red, Yellow, or Blue.

The table shows the probabilities for Black and Red.

Colour	Black	Red	Yellow	Blue
Probability	0.15	0.3	?	?

The probability of landing on Yellow is the same as the probability of landing on Blue.

Work out the probability that the spinner lands on Yellow.

WORKING OUT SPACE

Answer:**Question 4** **Non-Calculator****(3 marks)**

A biased spinner can land on White, Red, Blue, or Black.

The table shows the probabilities for White and Red.

Colour	White	Red	Blue	Black
Probability	0.1	0.2	?	?

The probability of landing on Blue is three times the probability of landing on Black.

Work out the probability that the spinner lands on Black.

WORKING OUT SPACE

Answer:

Question 5 **Non-Calculator****(3 marks)**

In a bag there are Blue, Green, Yellow and Black counters.
The table shows the probabilities of picking each colour.

Colour	Blue	Green	Yellow	Black
Probability	0.2	0.1	0.2	0.5

There are 12 Yellow counters in the bag.

Work out the number of Black counters in the bag.

WORKING OUT SPACE

Answer:**Question 6** **Non-Calculator****(3 marks)**

In a bag there are Blue, Green, Yellow and Black counters.
The table shows the probabilities of picking each colour.

Colour	Blue	Green	Yellow	Black
Probability	0.3	0.1	0.2	0.4

There are 24 Blue counters in the bag.

Work out the total number of counters in the bag.

WORKING OUT SPACE

Answer:

Scatter Graphs

EDEXCEL GCSE EXAM PRACTICE

Total: 11 marks

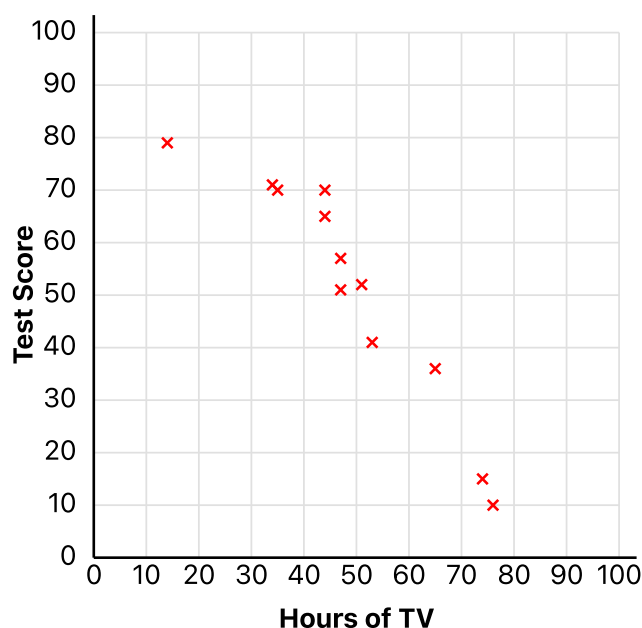
Scatter Graphs — Practice Questions

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ☒ Non-Calculator

(1 mark)

The scatter graph shows information about Hours of TV and Test Score.



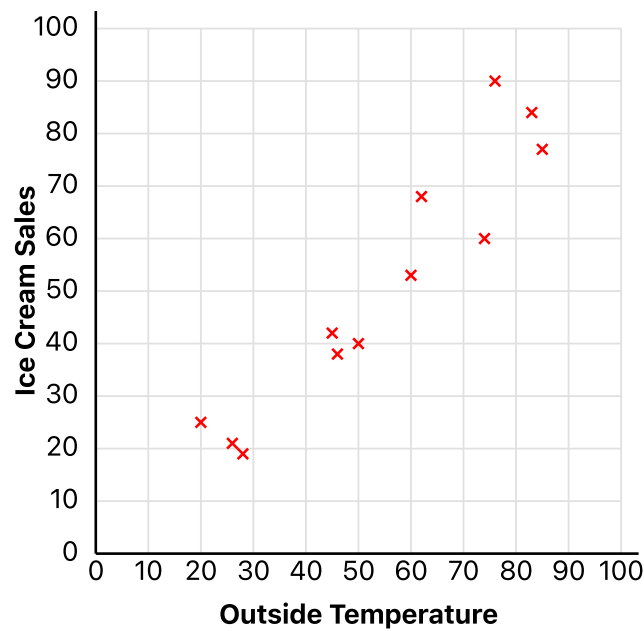
What type of correlation does the scatter graph show?

WORKING OUT SPACE

Answer:

Question 2 **Non-Calculator****(1 mark)**

The scatter graph shows information about Outside Temperature and Ice Cream Sales.



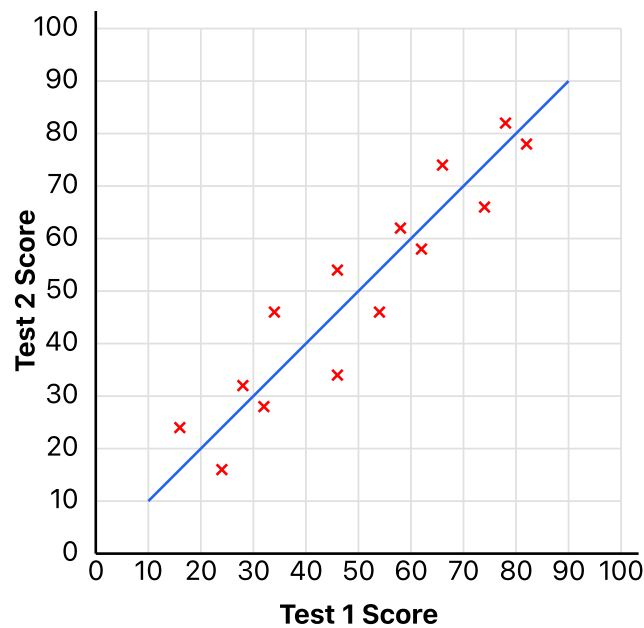
What type of correlation does the scatter graph show?

WORKING OUT SPACE

Answer:

Question 3 **Non-Calculator****(2 marks)**

The scatter graph shows the scores of some students in two tests.



Another student scored 45 in Test 1.

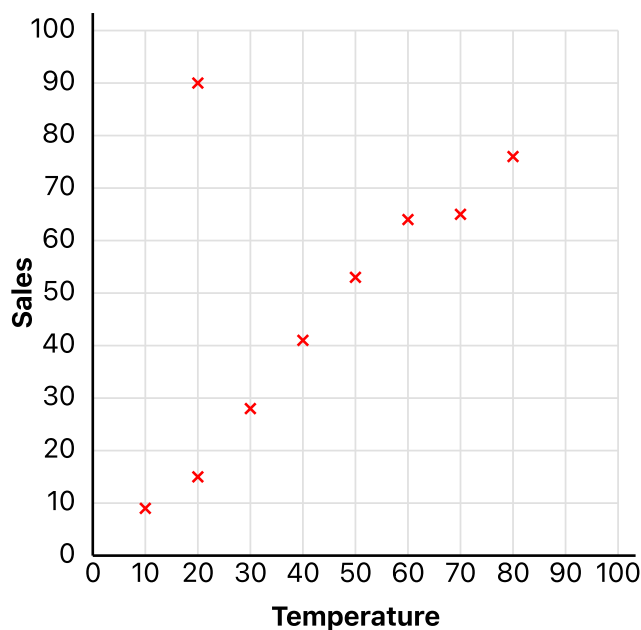
Estimate their score in Test 2 using the line of best fit.

WORKING OUT SPACE

Answer:

Question 4 **Non-Calculator****(2 marks)**

The scatter graph shows information about the average temperature and the sales of a shop.



One of the plotted points is an outlier that does not fit the general trend.

(a) Write down the coordinates of this outlier.

(b) For all the other points, describe the relationship between Temperature and Sales.

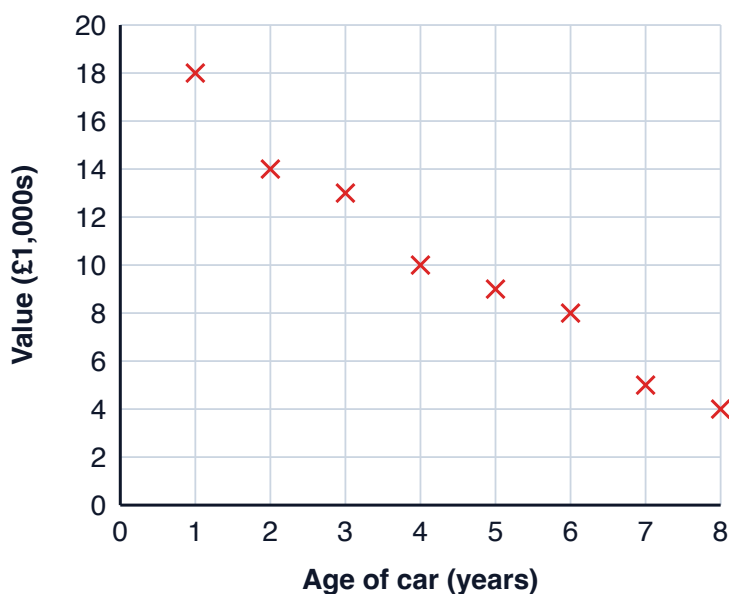
WORKING OUT SPACE

(a) (..... ,)

(b)

Question 5 ✎ Non-Calculator**(2 marks)**

The scatter graph shows the age and the value of 8 cars of the same model.



Draw a line of best fit on the scatter graph and use it to estimate the value of a car that is 5 years old.

WORKING OUT SPACE

Answer:

Question 6 ✎ Non-Calculator**(3 marks)**

Referring to the car value scatter graph in Question 5 (which covers cars aged 1 to 8 years), use the line of best fit you drew:

(a) Estimate the age of a car valued at £13,000.

(b) Explain why using the line of best fit to estimate the value of a 12-year-old car would be unreliable.

WORKING OUT SPACE

(a) years**(b)**

EDEXCEL GCSE PAPER 1 — NON-CALCULATOR (GRADE 4 CROSSOVER)

Mixed Review 1 of 2

Mixed Review 1 — Choosing the Right Method (Non-Calculator)

Total: 42 marks

These 15 unseen Grade 4 crossover questions are mixed across topics with no topic headings — just like a real Edexcel Paper 1 exam.

Question 1 ☒ Non-Calculator

(2 marks)

Express 120 as a product of its prime factors in index form.

WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(2 marks)

Simplify fully:

$$\frac{15x^8 \times 2x^3}{5x^4}$$

WORKING OUT SPACE

Answer:

Question 3 ☒ Non-Calculator

(3 marks)

Expand and simplify:

$$4(3x - 2) - 3(2x - 5)$$

WORKING OUT SPACE

Answer:

Question 4 **Non-Calculator****(3 marks)**

Here are the first five terms of an arithmetic sequence:

$$7, \quad 13, \quad 19, \quad 25, \quad 31$$

(a) Find an expression, in terms of n , for the n th term of this sequence.

(b) Explain why 95 is **not** a term in this sequence.

WORKING OUT SPACE

(a)**(b)****Question 5** **Non-Calculator****(2 marks)**

Buses to Acton leave a station every 12 minutes.

Buses to Barnet leave the same station every 16 minutes.

A bus to Acton and a bus to Barnet both leave the station at 09 : 00.

At what time will a bus to Acton and a bus to Barnet next leave the station at the same time?

WORKING OUT SPACE

Answer:**Question 6** **Non-Calculator****(3 marks)**

Solve the equation:

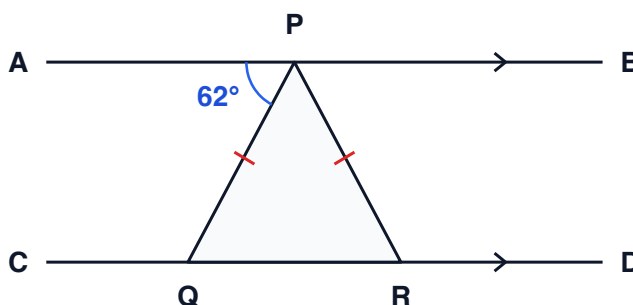
$$7x - 11 = 3x + 17$$

WORKING OUT SPACE

Answer:

Question 7 ✎ Non-Calculator**(3 marks)****(a)** Solve the inequality $3y - 4 \leq 11$.**(b)** Write down all the integer values of n that satisfy $-6 < 2n \leq 4$.

WORKING OUT SPACE

(a) **(b)****Question 8** ✎ Non-Calculator**(3 marks)**In the diagram, line APB is parallel to line $CQRD$, and $PQ = PR$.Angle $APQ = 62^\circ$.Work out the size of angle QPR . Give a geometric reason for each stage of your working.

WORKING OUT SPACE

Answer:**Question 9** ✎ Non-Calculator**(3 marks)**Each exterior angle of a regular polygon is 24° .**(a)** Work out the number of sides of the regular polygon.**(b)** Work out the sum of the interior angles of this polygon.

WORKING OUT SPACE

(a) **(b)**[°]

Question 10 ✎ Non-Calculator**(2 marks)**

The bearing of port B from port A is 074° .

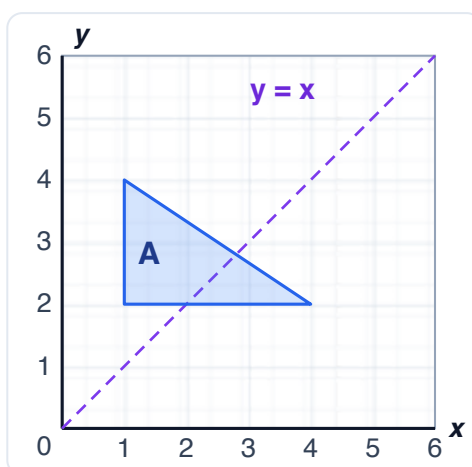
Work out the three-figure bearing of port A from port B .

WORKING OUT SPACE

Answer:

Question 11 ✎ Non-Calculator**(3 marks)**

Triangle A has vertices at $(1, 2)$, $(4, 2)$ and $(1, 4)$. It is drawn on the grid below, together with the mirror line $y = x$.



Triangle A is reflected in the line $y = x$ to give Triangle B .

Draw Triangle B on the grid and write down the coordinates of its three vertices.

WORKING OUT SPACE

Answer:

Question 12 ✎ Non-Calculator**(3 marks)**

A biased four-sided spinner can land on Red, Blue, Green or Yellow. The table shows the probabilities.

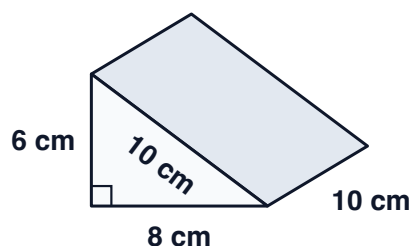
Colour	Red	Blue	Green	Yellow
Probability	0.25	0.15	$3x$	x

(a) Work out the value of x .

(b) The spinner is spun 200 times. Work out an estimate for the number of times it lands on Green.

WORKING OUT SPACE

(a) $x =$ (b)

Question 13 **Non-Calculator****(4 marks)**

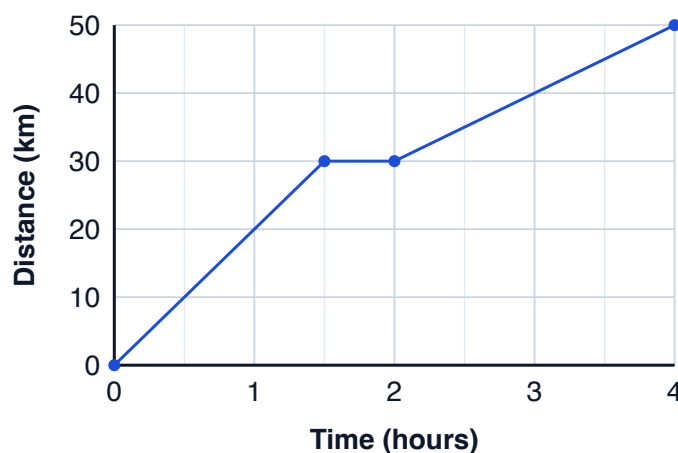
The diagram shows a solid triangular prism of length 10 cm.

The cross-section is a right-angled triangle with base 8 cm, height 6 cm and slanted edge 10 cm.

Work out **(a)** the volume of the prism, and **(b)** the total surface area of the prism.

WORKING OUT SPACE

(a) cm^3 **(b)** cm^2

Question 14 **Non-Calculator****(3 marks)**

The distance-time graph shows a cyclist's 4-hour journey.

(a) Work out the cyclist's speed during the first 1.5 hours in km/h.

(b) Work out the cyclist's average speed for the entire 4-hour journey in km/h.

WORKING OUT SPACE

(a) km/h **(b)** km/h

Question 15 **Non-Calculator****(3 marks)**

Factorise fully:

(a) $18a - 27$

(b) $12x^2y + 16xy^2$

WORKING OUT SPACE

(a)**(b)**

EDEXCEL GCSE PAPER 2/3 — CALCULATOR (GRADE 4 CROSSOVER)

Mixed Review 2 of 2

Mixed Review 2 — Choosing the Right Method (Calculator)

Total: 43 marks

These 15 unseen Grade 4 crossover questions are interleaved across topics to test method selection under Calculator Paper 2/3 conditions.

Question 1 Calculator

(2 marks)

Increase £480 by 6.5%.

WORKING OUT SPACE

Answer:

Question 2 Calculator

(3 marks)

Liam invests £5,000 in a savings account for 4 years.
The account pays 3.2% compound interest per annum.
Work out the total amount of **interest** Liam earns at the end of the 4 years.
Give your answer to the nearest penny.

WORKING OUT SPACE

Answer:

Question 3 Calculator

(3 marks)

Given that $A = 2^3 \times 3^2 \times 11$ and $B = 2^2 \times 3^4 \times 5$:

(a) Find the Highest Common Factor (HCF) of A and B .

(b) Find the Lowest Common Multiple (LCM) of A and B .

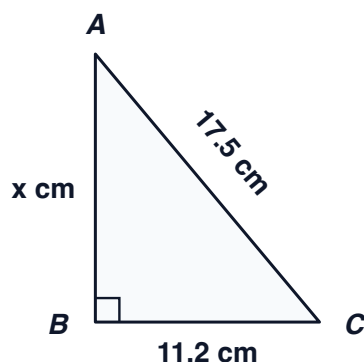
WORKING OUT SPACE

(a) (b)

Question 4

Calculator

(3 marks)



Calculate the length of side AB (x). Give your answer correct to 1 decimal place.

WORKING OUT SPACE

Answer:

Question 5

Calculator

(3 marks)

The angles, in degrees, of a quadrilateral are $(2x + 10)^\circ$, $(3x - 20)^\circ$, $(x + 40)^\circ$ and $(3x + 15)^\circ$.
Form an equation and solve it to find the size of the **largest** angle in the quadrilateral.

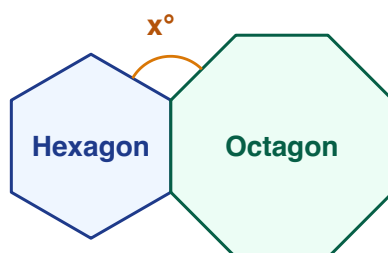
WORKING OUT SPACE

Answer:

Question 6

Calculator

(3 marks)



A regular hexagon and a regular octagon share a side.
Work out the size of the exterior gap angle x between the two polygons.

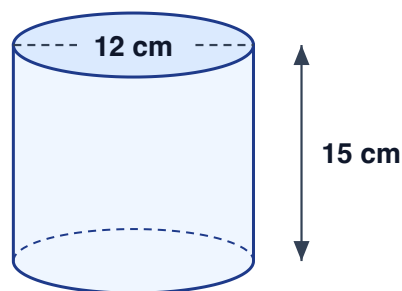
WORKING OUT SPACE

Answer:

Question 7

 Calculator

(3 marks)



A solid cylinder has a base diameter of 12 cm and a height of 15 cm.
Calculate the **total surface area** of the cylinder. Give your answer correct to 1 decimal place.

WORKING OUT SPACE

Answer:

Question 8

 Calculator

(4 marks)

The grouped frequency table shows the weights, w grams, of 50 apples.

Weight w (grams)	Frequency
$100 < w \leq 120$	8
$120 < w \leq 140$	17
$140 < w \leq 160$	15
$160 < w \leq 180$	10

- (a) Write down the modal class.
(b) Work out an estimate for the mean weight of an apple.

WORKING OUT SPACE

(a) (b) g

Question 9 **Calculator****(3 marks)**

A ship sails 24 km due North from port P to buoy Q , and then sails 18 km due West from Q to lighthouse R .

Work out the direct distance PR in km.

WORKING OUT SPACE

Answer:

Question 10 **Calculator****(3 marks)**

Solve $4(2x - 3) > 18$, and write down the smallest integer value of x that satisfies the inequality.

WORKING OUT SPACE

Answer:

Question 11 **Calculator****(3 marks)**

A rectangular water tank measures 60 cm by 40 cm by 50 cm.

The tank is completely full of water.

Water is drained from the tank at a steady rate of 8 litres per minute.

Work out how many minutes it takes to empty the tank completely. (1 litre = 1000 cm³)

WORKING OUT SPACE

Answer:

Question 12 **Calculator****(2 marks)**

A scale drawing of a park uses a scale of 1 cm represents 2.5 m.

A circular flowerbed has a real-life radius of 8.5 m.

Work out the compass radius, in cm, needed to draw the boundary of the flowerbed on the scale drawing.

WORKING OUT SPACE

Answer:

Question 13 **Calculator****(3 marks)**

A van is bought for £22,000.

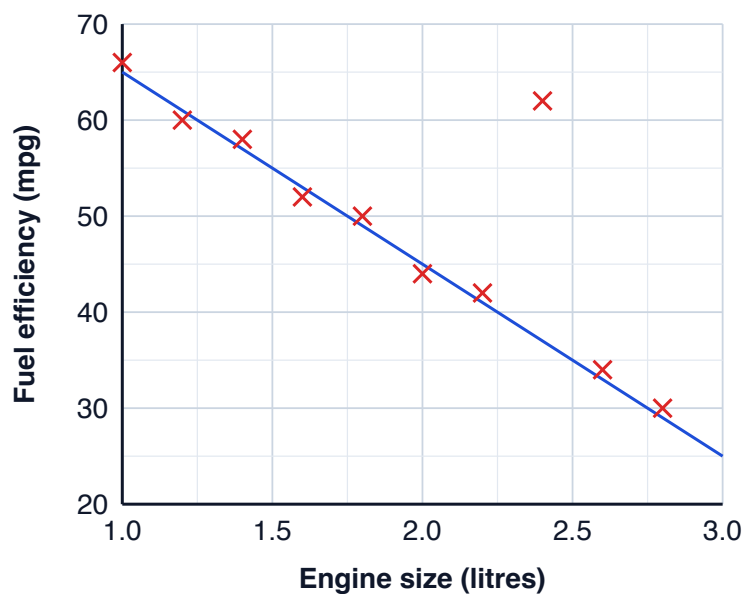
In the first year, its value depreciates by 18%.

In each of the second and third years, its value depreciates by 12% per year.

Work out the value of the van at the end of the 3 years. Give your answer to the nearest pound.

WORKING OUT SPACE

Answer:

Question 14 **Calculator****(3 marks)**

The scatter graph shows the engine size and fuel efficiency of 10 cars.

(a) Write down the coordinates of the outlier.

(b) Use the line of best fit to estimate the fuel efficiency of a car with a 2.0-litre engine.

(c) Explain why it would not be sensible to use the graph to estimate the fuel efficiency of a 4.5-litre sports car.

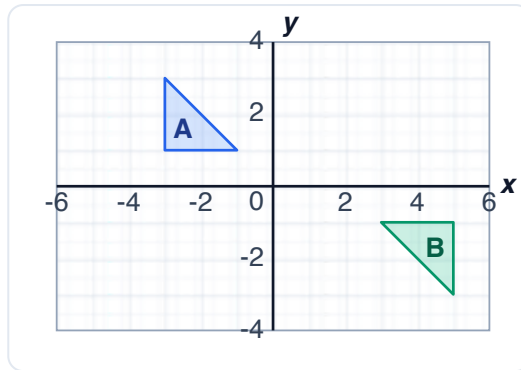
WORKING OUT SPACE

(a) (..... ,) (b) mpg

(c)

Question 15 **Calculator****(2 marks)**

Shape A and Shape B are drawn on the coordinate grid below.



Describe fully the single transformation that maps Shape A onto Shape B .

WORKING OUT SPACE

Answer:

APPENDIX

Answers & Mark Schemes

Complete Edexcel Crossover answers, completed solution diagrams, and Mixed Review topic guides.

Topic 1: Percentage Multipliers

Q1 (Non-Calc):	£59.50	[2m]
Q2 (Non-Calc):	£208	[2m]
Q3 (Calc):	£355.30	[2m]
Q4 (Calc):	£227.50	[2m]
Q5 (Non-Calc):	£126	[2m]
Q6 (Calc):	Multiplier = 1.08 (1.2×0.9); 8% increase	[3m]

Topic 2: Compound Interest

Q1 (Calc):	£8,988.80	[2m]
Q2 (Calc):	£1,180.98	[2m]
Q3 (Calc):	£1,195.54	[3m]
Q4 (Calc):	£290,148.33	[3m]
Q5 (Calc):	£12.83	[3m]
Q6 (Calc):	4 years	[2m]

Topic 3: Prime Factor Trees

Q1 (Non-Calc):	$2 \times 3 \times 7$	[2m]
Q2 (Non-Calc):	$2^2 \times 3^2 \times 5$	[2m]
Q3 (Non-Calc):	$2 \times 3 \times 5^2$	[2m]
Q4 (Non-Calc):	$2^2 \times 3^3$	[2m]
Q5 (Non-Calc):	(a) $2^2 \times 5 \times 7$, (b) $k = 35$	[3m]
Q6 (Non-Calc):	$2^4 \times 5$	[2m]

Topic 4: HCF & LCM

Q1 (Non-Calc):	3	[2m]
Q2 (Non-Calc):	$117 (3^2 \times 13)$	[2m]
Q3 (Non-Calc):	120	[2m]
Q4 (Non-Calc):	$2520 (2^3 \times 3^2 \times 5 \times 7)$	[2m]
Q5 (Non-Calc):	210 seconds	[2m]
Q6 (Non-Calc):	24 and 56	[3m]

Topic 5: Laws of Indices

Q1 (Non-Calc):	p	[1m]
Q2 (Non-Calc):	1	[1m]
Q3 (Non-Calc):	a^{14}	[1m]
Q4 (Non-Calc):	p^{15}	[1m]
Q5 (Non-Calc):	y^8	[2m]
Q6 (Non-Calc):	$k = 7$	[3m]

Topic 6: Indices with Numbers & Letters

Q1 (Non-Calc):	$28b^6$	[2m]
Q2 (Non-Calc):	9	[1m]
Q3 (Non-Calc):	$8y^9$	[2m]
Q4 (Non-Calc):	$8a^9$	[2m]
Q5 (Non-Calc):	$10y^8$	[2m]
Q6 (Non-Calc):	$4m^7$	[2m]

Topic 7: Brackets (Single)

- Q1 (Non-Calc): $8n - 18$ [2m]
 Q2 (Non-Calc): $4x + 23$ [2m]
 Q3 (Non-Calc): $3(5y - 2)$ [2m]
 Q4 (Non-Calc): $n^2 - nq$ [2m]
 Q5 (Non-Calc): $4x(2x - 5y)$ [2m]
 Q6 (Non-Calc): $c = 5$ [3m]

Topic 8: Forming & Solving Equations

- Q1 (Non-Calc): $x = 7$ [2m]
 Q2 (Non-Calc): $x = 5$ [2m]
 Q3 (Non-Calc): **12 years old** [2m]
 Q4 (Non-Calc): **£15** [2m]
 Q5 (Non-Calc): $x = 54$ [2m]
 Q6 (Non-Calc): **46 cm ($x = 4$; 17 cm by 6 cm)** [4m]

Topic 9: Linear Inequalities

- Q1 (Non-Calc): $0 < x \leq 1$ [2m]
 Q2 (Non-Calc): $y \geq -3$ [2m]
 Q3 (Non-Calc): $-4, -3, -2, -1, 0, 1, 2, 3$ [2m]
 Q4 (Non-Calc): $x < 6$ [3m]
 Q5 (Non-Calc): $-2, -1, 0, 1, 2, 3$ [2m]
 Q6 (Non-Calc): $x \leq 6$ [3m]

Topic 10: Linear & Special Sequences

- Q1 (Non-Calc): $-3n + 4$ [2m]
 Q2 (Non-Calc): **16, 26** [2m]
 Q3 (Non-Calc): **No ($n^2 + 4 = 32 \Rightarrow n^2 = 28$, not a square number)** [2m]
 Q4 (Non-Calc): **444** [1m]
 Q5 (Non-Calc): **No ($4n + 8 = 46 \Rightarrow 4n = 38 \Rightarrow n = 9.5$, not an integer)** [2m]
 Q6 (Non-Calc): -2 [2m]

Topic 11: Real Life Graphs

- Q1 (Non-Calc): **12 km/h** [2m]
 Q2 (Non-Calc): **5 m/s** [2m]
 Q3 (Non-Calc): **£3 per kg** [2m]
 Q4 (Non-Calc): **(a) £10, (b) £30 (£10 + $4 \times$ £5)** [3m]
 Q5 (Non-Calc): **200 litres/hour** [2m]
 Q6 (Non-Calc): **100 litres/minute** [2m]

Topic 12: Angles in Parallel Lines

- Q1 (Non-Calc): **58°** [1m]
 Q2 (Non-Calc): **68°** [2m]
 Q3 (Non-Calc): **44°** [3m]
 Q4 (Non-Calc): **21°** [2m]
 Q5 (Non-Calc): $x = 24$ [2m]
 Q6 (Non-Calc): **72°** [2m]

Topic 13: Angles in Polygons

Q1 (Non-Calc):	144°	[2m]
Q2 (Non-Calc):	45°	[2m]
Q3 (Non-Calc):	$x = 97$	[3m]
Q4 (Non-Calc):	$x = 54$	[3m]
Q5 (Non-Calc):	132°	[3m]
Q6 (Non-Calc):	20 sides	[3m]

Topic 14: Bearings

Q1 (Non-Calc):	218°	[2m]
Q2 (Non-Calc):	244°	[2m]
Q3 (Non-Calc):	36 km	[2m]
Q4 (Non-Calc):	96°	[3m]
Q5 (Calc):	20 km	[2m]
Q6 (Calc):	037°	[2m]

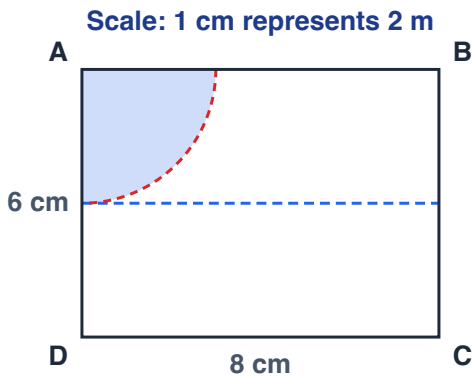
Topic 15: Translations, Reflections & Rotations

Q1 (Non-Calc):	$(6, -5)$	[2m]
Q2 (Non-Calc):	$(3, -3)$	[2m]
Q3 (Non-Calc):	Reflection in the line $x = -1$	[2m]
Q4 (Non-Calc):	$(2, -3)$	[2m]
Q5 (Non-Calc):	Rotation, 90° clockwise, centre $(0, 0)$	[3m]
Q6 (Non-Calc):	$(2, -1)$	[2m]

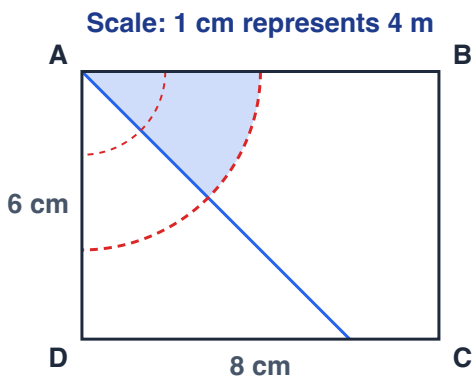
Topic 16: Constructions & Loci

Q1 (Non-Calc):	4.8 cm	[2m]
Q2 (Non-Calc):	37°	[2m]
Q3 (Non-Calc):	22 cm	[2m]
Q4 (Non-Calc):	15 cm	[2m]
Q5 (Non-Calc):	3 cm (shaded region below)	[3m]
Q6 (Non-Calc):	4 cm (shaded region below)	[4m]

Q5 — Completed Construction & Shaded Region



Q6 — Completed Construction & Shaded Region



Topic 17: Pythagoras' Theorem

Q1 (Calc):	12.5 m	[3m]
Q2 (Calc):	13.6 m	[3m]
Q3 (Calc):	1.5 cm	[3m]
Q4 (Calc):	9.2 cm	[3m]
Q5 (Non-Calc):	80 cm²	[3m]
Q6 (Non-Calc):	48 cm²	[3m]

Topic 18: Surface Area

Q1 (Non-Calc):	184 m²	[3m]
Q2 (Non-Calc):	156 cm²	[3m]
Q3 (Calc):	4 pots	[4m]
Q4 (Calc):	2 pots	[4m]
Q5 (Non-Calc):	1152 cm²	[4m]
Q6 (Non-Calc):	398 cm²	[4m]

Topic 19: Volume of Prisms

- Q1 (Non-Calc): **315 m³** [3m]
 Q2 (Non-Calc): **1036 cm³ (74 × 14)** [3m]
 Q3 (Non-Calc): **$x = 6$** [3m]
 Q4 (Non-Calc): **$x = 7$** [3m]
 Q5 (Non-Calc): **20 watering cans** [4m]
 Q6 (Non-Calc): **300 crates** [4m]

Topic 20: Cylinders

- Q1 (Calc): **867.1 m²** [3m]
 Q2 (Calc): **3220 cm³** [3m]
 Q3 (Calc): **22,600 cm³** [3m]
 Q4 (Calc): **329 m³** [4m]
 Q5 (Calc): **34 minutes** [4m]
 Q6 (Calc): **6 cans** [4m]

Topic 21: Averages from Tables

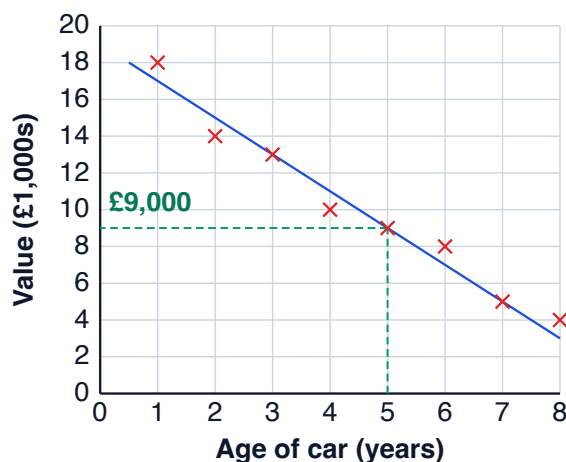
- Q1 (Non-Calc): **(a) 2, (b) 2** [2m]
 Q2 (Non-Calc): **(a) $f = 4$, (b) 1.3** [3m]
 Q3 (Calc): **21.3 minutes** [3m]
 Q4 (Calc): **48.5 minutes** [3m]
 Q5 (Non-Calc): **$20 < t \leq 40$** [1m]
 Q6 (Non-Calc): **$40 < t \leq 60$** [2m]

Topic 22: Relative Frequency

- Q1 (Non-Calc): **165** [2m]
 Q2 (Non-Calc): **(a) 0.25, (b) 75** [3m]
 Q3 (Non-Calc): **0.275** [3m]
 Q4 (Non-Calc): **0.175** [3m]
 Q5 (Non-Calc): **30 black counters** [3m]
 Q6 (Non-Calc): **80 counters** [3m]

Topic 23: Scatter Graphs

- Q1 (Non-Calc): **Negative** [1m]
 Q2 (Non-Calc): **Positive** [1m]
 Q3 (Non-Calc): **45** [2m]
 Q4 (Non-Calc): **(a) (20, 90), (b) As temperature increases, sales increase** [2m]
 Q5 (Non-Calc): **£9,000 (see line of best fit below)** [2m]
 Q6 (Non-Calc): **(a) 3 years, (b) Extrapolation: 12 years is outside the data range** [3m]

Q5 — Line of Best Fit & Reading

Mixed Review 1 — Choosing the Right Method (Non-Calculator) — Answers & Topic Guide

Q1 (Prime Factor Trees, Non-Calc):

$$2^3 \times 3 \times 5 \quad [2m]$$

Q2 (Indices with Numbers & Letters, Non-Calc):

$$6x^7 \quad [2m]$$

Q3 (Brackets (Single), Non-Calc):

$$\frac{6x + 7}{(12x - 8 - 6x + 15)} \quad [3m]$$

Q4 (Linear Sequences, Non-Calc):

$$\begin{aligned} & \text{(a) } 6n + 1, \text{ (b) } \\ & 6n + 1 = 95 \Rightarrow \\ & 6n = 94 \text{ (not an integer)} \end{aligned} \quad [3m]$$

Q5 (HCF & LCM Context, Non-Calc):

$$09:48 \text{ (LCM} = 48 \text{ minutes)} \quad [2m]$$

Q6 (Forming & Solving Equations, Non-Calc):

$$x = 7 \quad (4x = 28) \quad [3m]$$

Q7 (Linear Inequalities, Non-Calc):

$$\text{(a) } y \leq 5, \text{ (b) } -2, -1, 0, 1, 2 \quad [3m]$$

Q8 (Angles in Parallel Lines, Non-Calc):

$$56^\circ \text{ (} \angle PQR = 62^\circ \text{ alt., } \angle PRQ = 62^\circ \text{ isosceles)} \quad [3m]$$

Q9 (Angles in Polygons, Non-Calc):

$$\text{(a) 15 sides (} 360 \div 24 \text{), (b) } 2340^\circ (13 \times 180^\circ) \quad [3m]$$

Q10 (Bearings, Non-Calc):

$$254^\circ (74^\circ + 180^\circ) \quad [2m]$$

Q11 (Reflections, Non-Calc):

$$(2, 1), (2, 4), (4, 1) \quad [3m]$$

Q12 (Relative Frequency, Non-Calc):

$$\text{(a) } x = 0.15, \text{ (b) } 90 (0.45 \times 200) \quad [3m]$$

Q13 (Volume & Surface Area of Prism, Non-Calc):

$$\text{(a) } 240 \text{ cm}^3, \text{ (b) } 288 \text{ cm}^2 (48 + 240) \quad [4m]$$

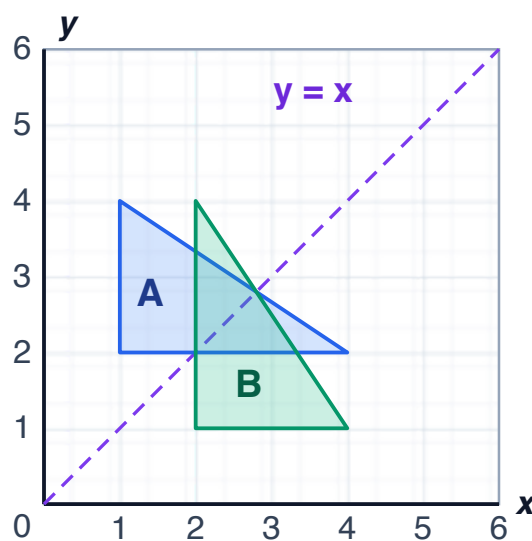
Q14 (Real Life Graphs, Non-Calc):

$$\begin{aligned} & \text{(a) } 20 \text{ km/h} \\ & (30 \div 1.5), \text{ (b) } 12.5 \text{ km/h} (50 \div 4) \end{aligned} \quad [3m]$$

Q15 (Factorising Single Brackets, Non-Calc):

$$\text{(a) } 9(2a - 3), \text{ (b) } 4xy(3x + 4y) \quad [3m]$$

Q11 — Completed Solution Diagram



Mixed Review 2 — Choosing the Right Method (Calculator) — Answers & Topic Guide**Q1** (Percentage Multipliers, Calc):

$$\text{£}511.20$$

$$(480 \times 1.065)$$

[2m]

Q2 (Compound Interest, Calc):

$$\text{£}671.38$$

$$(5671.38 - 5000)$$

[3m]

Q3 (HCF & LCM Prime Factors, Calc):

$$\text{(a) HCF} = 36$$

$$(2^2 \times 3^2), \text{(b) LCM}$$

$$= 35,640$$

[3m]

Q4 (Pythagoras Shorter Side, Calc):

$$13.4 \text{ cm}$$

$$(\sqrt{17.5^2 - 11.2^2})$$

[3m]

Q5 (Equations from Angles, Calc):

$$120^\circ (9x + 45 = 360$$

$$\Rightarrow x = 35)$$

[3m]

Q6 (Angles in Polygons, Calc):

$$105^\circ (360^\circ - 120^\circ$$

$$- 135^\circ)$$

[3m]

Q7 (Cylinders Surface Area, Calc):

$$791.7 \text{ cm}^2 (252\pi)$$

[3m]

Q8 (Averages from Grouped Tables, Calc):

$$\text{(a) } 120 < w \leq 140,$$

$$\text{(b) } 140.8 \text{ g}$$

$$(7040 \div 50)$$

[4m]

Q9 (Bearings & Pythagoras, Calc):

$$30 \text{ km } (\sqrt{24^2 + 18^2})$$

[3m]

Q10 (Linear Inequalities, Calc):

$$x > 3.75, \text{ so smallest integer is } 4$$

[3m]

Q11 (Volume & Capacity, Calc):

$$15 \text{ minutes } (120 \text{ litres} \div 8)$$

[3m]

Q12 (Loci & Scale Drawings, Calc):

$$3.4 \text{ cm } (8.5 \div 2.5)$$

[2m]

Q13 (Compound Depreciation, Calc):

$$\text{£}13,970$$

$$(22000 \times 0.82$$

$$\times 0.88^2)$$

[3m]

Q14 (Scatter Graphs, Calc):

$$\text{(a) } (2.4, 62), \text{(b) } 45$$

$$\text{mpg, (c) Extrapolation}$$

[3m]

Q15 (Rotations, Calc):

$$\text{Rotation, } 180^\circ, \text{ centre}$$

$$(1, 0)$$

[2m]