

GCSE MATHEMATICS (9-1) — EXAM PRACTICE WORKBOOK

Grade 5 Mathematics — Practice Questions

(Foundation & Higher Crossover)

Higher & Foundation 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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Click any topic to jump straight there. Complete both Mixed Review Sets before checking the Answer Key Appendix.

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Reverse Percentages

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

Reverse Percentages — 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)**

The population of a village increases by 5% to 2,310.
What was the population of the village before the increase?

WORKING OUT SPACE

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

In a sale, the normal price of a book is reduced by 20%. The sale price of the book is £4.80.
Work out the normal price of the book.

WORKING OUT SPACE

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

A smartphone is on sale at 10% off for £495.
Calculate the normal price of the smartphone.

WORKING OUT SPACE

Answer:

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

In a sale, all items are discounted by 20%. A customer saves £35 on a tablet.
What was the normal price of the tablet?

WORKING OUT SPACE

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

A coffee machine is discounted by 16%, which reduces the price by £24.
Find the normal price of the coffee machine.

WORKING OUT SPACE

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

In a sale, normal prices are reduced by 15%. The sale price of a coat is £119.
Work out how much money a customer saves by buying the coat in the sale.

WORKING OUT SPACE

Answer:

Standard Form (Converting)

EDEXCEL GCSE EXAM PRACTICE

Total: 8 marks

Standard Form (Converting) — 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)

Write 380,000 in standard form.

WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(1 mark)

Write 4.15×10^6 as an ordinary number.

WORKING OUT SPACE

Answer:

Question 3 ☒ Non-Calculator

(1 mark)

Write 5 million in standard form.

WORKING OUT SPACE

Answer:

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

Write 0.00576 in standard form.

WORKING OUT SPACE

Answer:

Question 5 Non-Calculator**(2 marks)**Write 0.048×10^{-3} as a number in standard form.

WORKING OUT SPACE

Answer:

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

Write these four numbers in order of size, starting with the smallest:

$$4.2 \times 10^4, \quad 420,000, \quad 4.5 \times 10^3, \quad 0.48 \times 10^5$$

WORKING OUT SPACE

Answer:

Standard Form (Calculating)

EDEXCEL GCSE EXAM PRACTICE

Total: 12 marks

Standard Form (Calculating) — 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)**

Work out $(7.2 \times 10^{-4}) \times (5 \times 10^8)$.
Give your answer in standard form.

WORKING OUT SPACE

Answer:

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

Work out $(6.7 \times 10^4) \times (3.4 \times 10^{-8})$.
Give your answer as an ordinary number.

WORKING OUT SPACE

Answer:

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

Calculate $(3.61 \times 10^8) + (8.51 \times 10^7)$.
Give your answer in standard form.

WORKING OUT SPACE

Answer:

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

A large rock has a weight of 1.2×10^4 grams.

Find, in standard form, the total weight of 12 of these large rocks.

WORKING OUT SPACE

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

The diameter of Neptune is 5.0×10^4 km.

The diameter of Mars is 6.8×10^3 km.

Calculate the difference between the diameter of Neptune and the diameter of Mars.

Give your answer in standard form.

WORKING OUT SPACE

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

The distance between Earth and Mars is 78 million kilometres.

The speed of light is 3×10^5 km/s.

Calculate the time, in seconds, it takes for light to travel from Earth to Mars.

Give your answer in standard form.

WORKING OUT SPACE

Answer:

Changing the Subject

EDEXCEL GCSE EXAM PRACTICE

Total: 15 marks

Changing the Subject — 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)

Make b the subject of the formula: $A = 3b + 9$

WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(2 marks)

Make x the subject of the formula: $y = \frac{1}{2}x + 6$

WORKING OUT SPACE

Answer:

Question 3 ☒ Non-Calculator

(3 marks)

Make n the subject of the formula: $m = \frac{5n + 1}{3}$

WORKING OUT SPACE

Answer:

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

Make A the subject of the formula: $P = \frac{F}{A}$

WORKING OUT SPACE

Answer:

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

Make b the subject of the formula: $a = \sqrt{\frac{2b-5}{3}}$

WORKING OUT SPACE

Answer:

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

Make x the subject of the formula: $y = 2x^2 + 7$

WORKING OUT SPACE

Answer:

Gradient of a Line

EDEXCEL GCSE EXAM PRACTICE

Total: 14 marks

Gradient of a Line — 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)**

A line has the equation $y = 3x + 9$.
Write down the gradient of the line.

WORKING OUT SPACE

Answer:

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

Find the gradient of the line passing through $(3, 5)$ and $(7, 17)$.

WORKING OUT SPACE

Answer:

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

Find the gradient of the line passing through $(-3, 10)$ and $(5, -6)$.

WORKING OUT SPACE

Answer:

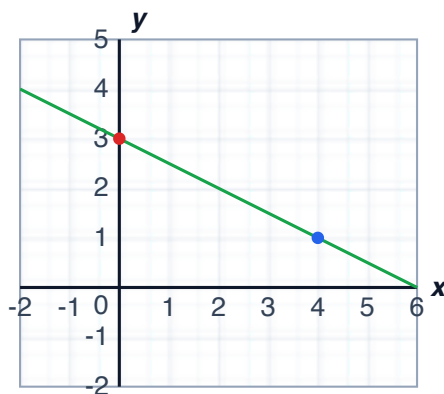
Question 4 ✎ Non-Calculator**(3 marks)**

A line passes through $(2, 2)$ and $(5, k)$.

The gradient is 3. Work out the value of k .

WORKING OUT SPACE

Answer:

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

Find the equation of the line shown on the grid in the form $y = mx + c$.

WORKING OUT SPACE

Answer:

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

The line passing through $(-2, 5)$ and $(4, k)$ has a gradient of $-\frac{3}{2}$.

Work out the value of k .

WORKING OUT SPACE

Answer:

Equation of a Line

EDEXCEL GCSE EXAM PRACTICE

Total: 16 marks

Equation of a Line — 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 straight line has equation $y = 2x + 4$.

- (a) Write down the gradient.
(b) Write down the y-intercept.

WORKING OUT SPACE

(a) Gradient: (b) y-intercept:

Question 2 ✎ Non-Calculator

(3 marks)

A line has a gradient of 2 and passes through (3, 1).
Find the equation of the line in the form $y = mx + c$.

WORKING OUT SPACE

Answer:

Question 3 ✎ Non-Calculator

(2 marks)

Find the gradient of the line $2y - 8x = 4$.

WORKING OUT SPACE

Answer:

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

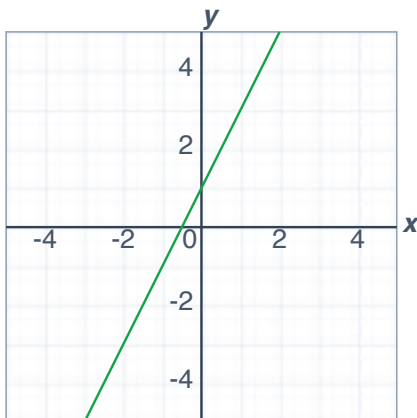
Find the equation of a line parallel to $y = 2x + 4$ passing through $(0, 2)$.

WORKING OUT SPACE

Answer:

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

Find the equation of the line shown on the grid in the form $y = mx + c$.



WORKING OUT SPACE

Answer:

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

Find the equation of the straight line that passes through the points $(1, 9)$ and $(5, 1)$.

Give your answer in the form $y = mx + c$.

WORKING OUT SPACE

Answer:

Expanding & Factorising Quadratics

EDEXCEL GCSE EXAM PRACTICE

Total: 12 marks

Expanding & Factorising Quadratics — 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 and simplify $(2x + 3)(3x - 1)$

WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(2 marks)

Expand and simplify $(x - 2)(x - 9)$

WORKING OUT SPACE

Answer:

Question 3 ☒ Non-Calculator

(2 marks)

Factorise $x^2 + 9x + 14$

WORKING OUT SPACE

Answer:

Question 4 ✎ Non-Calculator**(2 marks)**Factorise $x^2 - 49$

WORKING OUT SPACE

Answer:

Question 5 ✎ Non-Calculator**(2 marks)**Factorise $x^2 - 13x + 36$

WORKING OUT SPACE

Answer:

Question 6 ✎ Non-Calculator**(2 marks)**Factorise $x^2 - 4x - 21$

WORKING OUT SPACE

Answer:

Solving Quadratics by Factorising

EDEXCEL GCSE EXAM PRACTICE**Total: 11 marks**

Solving Quadratics by Factorising — 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)**

A quadratic curve crosses the x -axis at $x = -6$ and $x = 5$.

What are the roots of the quadratic equation?

WORKING OUT SPACE

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

(a) Factorise $y^2 - 10y + 9$

(b) Hence, solve $y^2 - 10y + 9 = 0$

WORKING OUT SPACE

(a) **(b)** $x =$ **Question 3** ☒ **Non-Calculator****(2 marks)**

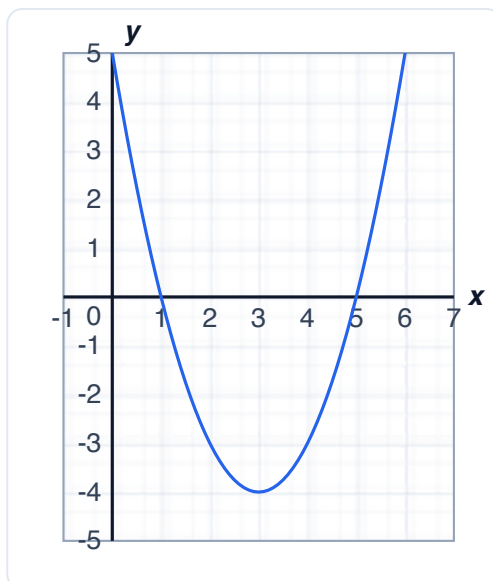
Solve $x^2 + 14x + 24 = 0$.

WORKING OUT SPACE

Answer:

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

The graph of $y = x^2 - 6x + 5$ is drawn on the grid.



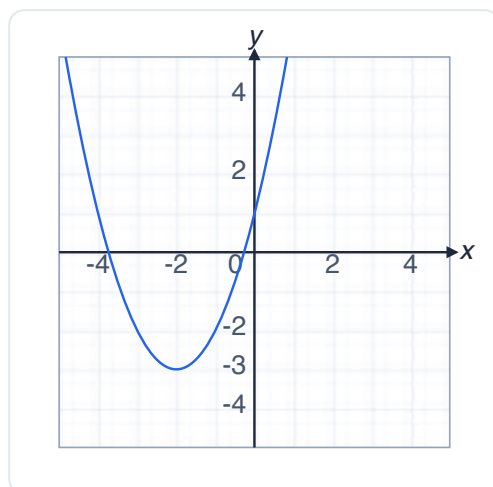
Write down the coordinates of the turning point of the graph.

WORKING OUT SPACE

Answer:

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

The graph of $y = x^2 + 4x + 1$ is drawn on the grid.



Write down the equation of the line of symmetry of the graph.

WORKING OUT SPACE

Answer:

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

A rectangle has length $(x + 5)$ cm and width $(x - 2)$ cm.

The area of the rectangle is 18 cm^2 .

Form and solve a quadratic equation to find the value of x .

WORKING OUT SPACE

Answer:

Linear Simultaneous Equations

EDEXCEL GCSE EXAM PRACTICE

Total: 21 marks

Linear Simultaneous 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

(3 marks)

Solve these simultaneous equations:

$$5x - 3y = 16$$

$$2x + 3y = 19$$

WORKING OUT SPACE

$$x = \dots\dots\dots y = \dots\dots\dots$$

Question 2 ☒ Non-Calculator

(3 marks)

Solve these simultaneous equations:

$$3x + 2y = 16$$

$$x + 4y = 12$$

WORKING OUT SPACE

$$x = \dots\dots\dots y = \dots\dots\dots$$

Question 3 ☒ Non-Calculator

(3 marks)

Solve these simultaneous equations:

$$2x + 5y = 21$$

$$3x - 2y = 3$$

WORKING OUT SPACE

$$x = \dots\dots\dots y = \dots\dots\dots$$

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

There is a total of 35 biscuits in 3 small tins and 2 large tins.

There is a total of 49 biscuits in 5 small tins and 1 large tin.

Work out the number of biscuits in a small tin and in a large tin.

WORKING OUT SPACE

Small tin: Large tin:

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

3 peak train tickets and 2 off-peak tickets cost £39.

2 peak tickets and 2 off-peak tickets cost £32.

Work out the price of a peak ticket and the price of an off-peak ticket.

WORKING OUT SPACE

Peak: £..... Off-peak: £.....

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

3 notebooks and 5 highlighters cost £19.

4 notebooks and 2 highlighters cost £16.

Work out the price of a notebook and the price of a highlighter.

WORKING OUT SPACE

Notebook: £..... Highlighter: £.....

Solving Equations Graphically

EDEXCEL GCSE EXAM PRACTICE

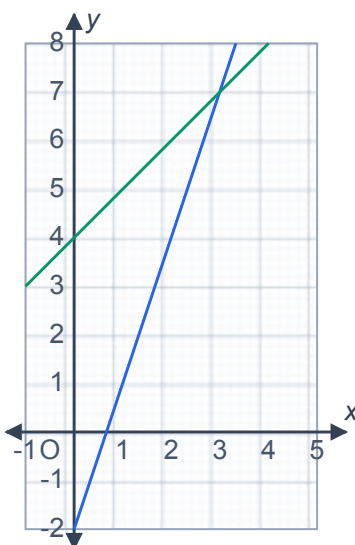
Total: 21 marks

Solving Equations Graphically — 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 graphs of the straight lines with equations $y = 3x - 2$ and $y = x + 4$ have been drawn on the grid.



Use the graphs to solve the simultaneous equations:

$$y = 3x - 2$$

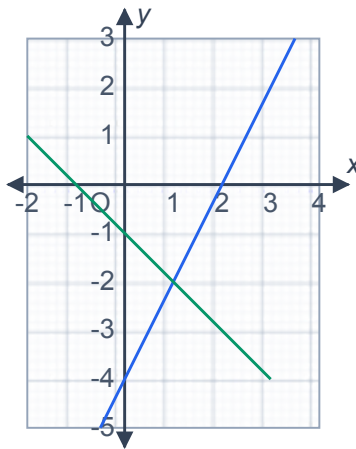
$$y = x + 4$$

WORKING OUT SPACE

 $x = \dots\dots\dots$ $y = \dots\dots\dots$

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

The graphs of the straight lines with equations $y = 2x - 4$ and $y = -x - 1$ have been drawn on the grid.



Use the graphs to solve the simultaneous equations:

$$y = 2x - 4$$

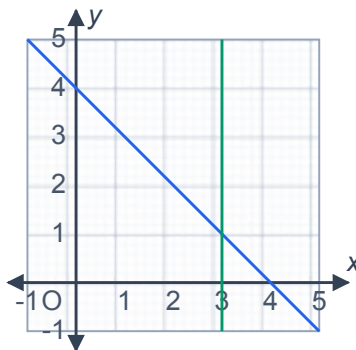
$$y = -x - 1$$

WORKING OUT SPACE

$x = \dots\dots\dots$ $y = \dots\dots\dots$

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

The graphs of the straight lines with equations $y = -x + 4$ and $x = 3$ have been drawn on the grid.



Use the graphs to solve the simultaneous equations:

$$y = -x + 4$$

$$x = 3$$

WORKING OUT SPACE

$x = \dots\dots\dots$ $y = \dots\dots\dots$

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

The equations of two straight lines are $y = 2x + 7$ and $y = -x + 1$.
Work out the coordinates of the point where the two lines intersect.

WORKING OUT SPACE

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

The equations of two straight lines are $y = 2x + 4$ and $y = -0.5x + 9$.
Work out the coordinates of the point where the two lines intersect.

WORKING OUT SPACE

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

The equations of two straight lines are $y = 2x + 6$ and $y = 5x - 6$.
Work out the coordinates of the point where the two lines intersect.

WORKING OUT SPACE

Answer:

Quadratic, Cubic & Reciprocal Graphs

EDEXCEL GCSE EXAM PRACTICE

Total: 15 marks

Quadratic, Cubic & Reciprocal Graphs — Practice Questions

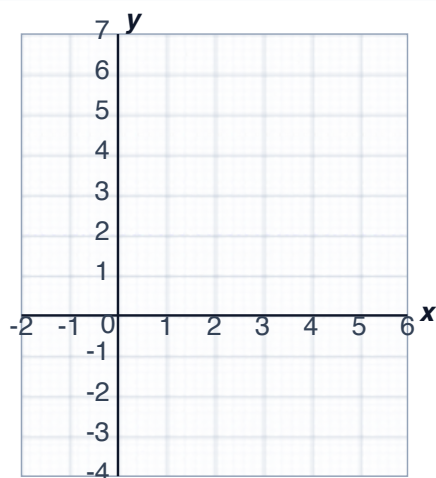
Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 ✎ Non-Calculator

(4 marks)

(i) Complete the table of values for $y = x^2 - 4x + 1$.

x	-1	0	1	2	3	4	5
y		1			-2		



(ii) On the grid, plot the points and draw the graph of $y = x^2 - 4x + 1$ for $-1 \leq x \leq 5$.

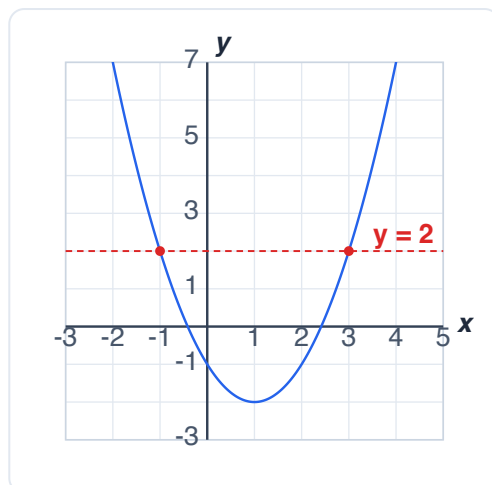
(iii) Write down the coordinates of the minimum turning point of the graph.

WORKING OUT SPACE

(iii) Turning point: (..... ,)

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

The graph of $y = x^2 - 2x - 1$ and the horizontal line $y = 2$ are drawn on the grid below.



Use the graph to find the positive solution to $x^2 - 2x - 1 = 2$.

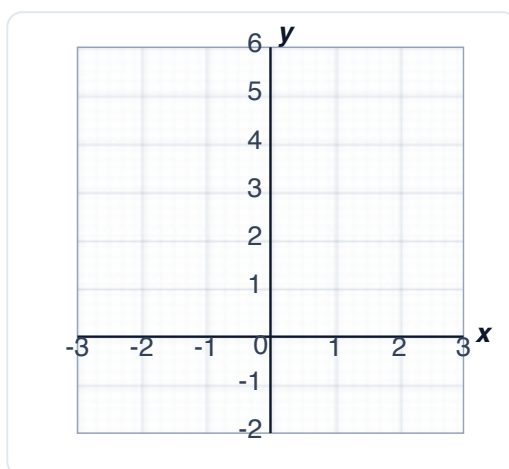
WORKING OUT SPACE

Answer:

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

(i) Complete the table of values for $y = x^3 - 3x + 2$.

x	-2	-1	0	1	2
y			2		



(ii) On the grid, plot the points and draw the graph of $y = x^3 - 3x + 2$ for $-2 \leq x \leq 2$.

(iii) Use your graph to find the positive solution to $x^3 - 3x + 2 = 4$.

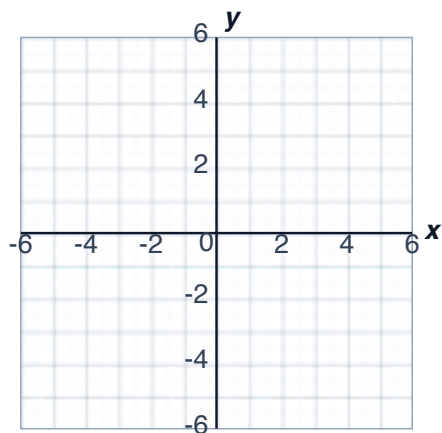
WORKING OUT SPACE

(iii) $x =$

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

(i) Complete the table of values for $y = \frac{6}{x}$.

x	-6	-3	-2	-1	1	2	3	6
y		-2			6			



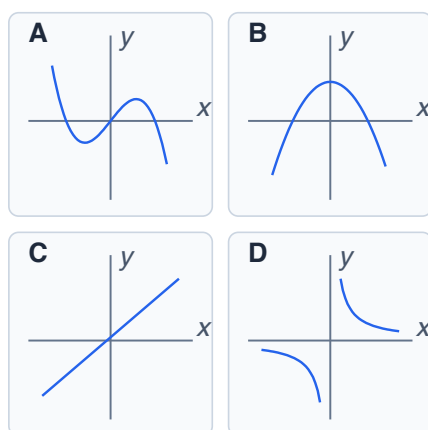
(ii) On the grid, plot the points and draw both branches of the graph of $y = \frac{6}{x}$ for $-6 \leq x \leq 6$ ($x \neq 0$).

(iii) Use your graph to find the value of x when $y = 1.5$.

WORKING OUT SPACE

(iii) $x =$ **Question 5** ✎ Non-Calculator**(1 mark)**

Four sketched graphs A , B , C , and D are shown below.



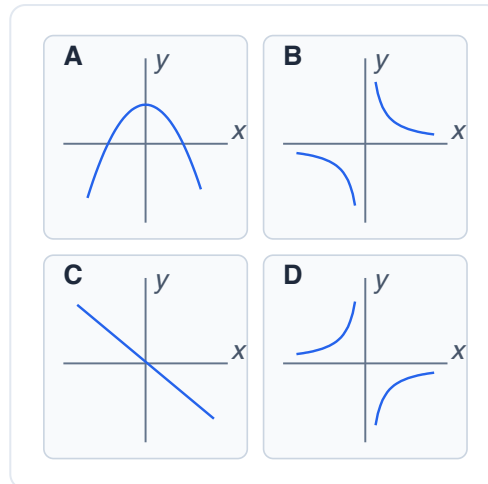
Write down the letter of the graph that shows $y = 3x - x^3$.

WORKING OUT SPACE

Answer:

Question 6 **Non-Calculator****(1 mark)**

Four sketched graphs A , B , C , and D are shown below.



Write down the letter of the graph that shows $y = -\frac{6}{x}$.

WORKING OUT SPACE

Answer:

Ratio Contexts

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

Ratio Contexts — 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)**

ABC is a straight line.

The length of BC is 3 times the length of AB .

$AC = 88$ metres.

Work out the length of BC .

WORKING OUT SPACE

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

Omar and Tariq share £360 in the ratio 8 : 10.

Omar gives half of his share to Zayd.

Tariq gives a tenth of his share to Zayd.

What fraction of the £360 did Zayd receive?

WORKING OUT SPACE

Answer:

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

Dan, Sam and Max share £680.

The ratio of the amount Dan gets to the amount Sam gets is 6 : 7.

Max gets 3 times the amount Sam gets.

Work out the amount of money that Sam gets.

WORKING OUT SPACE

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

Leo and Toby have a total of 36 stickers.

The ratio of Leo's stickers to Toby's stickers is 5 : 4.

Leo gives Toby some stickers.

The ratio of Leo's to Toby's stickers is now 2 : 4.

Work out how many stickers Leo gives to Toby.

WORKING OUT SPACE

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

The angles in a triangle are in the ratio 2 : 3 : 7.

Work out the size of the largest angle in the triangle.

WORKING OUT SPACE

Answer:

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

Flour, butter, and sugar are mixed to make shortbread in the ratio 5 : 3 : 2 by weight.

A baker has 1.2 kg of flour, 750 g of butter, and 420 g of sugar.

Work out the maximum total weight of shortbread, in grams, that the baker can make.

WORKING OUT SPACE

Answer:

Ratios & Fractions

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

Ratios & Fractions — 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)**

In a box of chocolates there are milk chocolates and dark chocolates.

The ratio of milk chocolates to dark chocolates is 5 : 7.

What fraction of the total are dark chocolates?

WORKING OUT SPACE

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

In a sports club, members play either tennis or badminton.

$\frac{3}{8}$ of the total are tennis players and the rest are badminton players.

Write down the ratio of tennis players to badminton players.

WORKING OUT SPACE

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

In a company the ratio of managers to workers is 1 : 4.

All of the workers are either full-time workers or part-time workers. The ratio of full-time workers to part-time workers is 3 : 2.

What fraction of all the people in the group are part-time workers?

WORKING OUT SPACE

Answer:

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

In a company the ratio of directors to employees is 1 : 3.

All of the employees are either office-based or remote. The ratio of office-based to remote is 1 : 4.

What percentage of all the people in the company are remote?

WORKING OUT SPACE

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

In a choir, the ratio of adults to juniors is 3 : 2.

30% of the adults and 50% of the juniors wear glasses.

What percentage of all the members in the choir wear glasses?

WORKING OUT SPACE

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

A bag contains only red counters and blue counters in the ratio 3 : 5.

6 more red counters are added to the bag, and the ratio of red counters to blue counters becomes 1 : 1.

Work out the total number of counters in the bag before the 6 red counters were added.

WORKING OUT SPACE

Answer:

Combining Ratios

EDEXCEL GCSE EXAM PRACTICE

Total: 14 marks

Combining Ratios — 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)

Given that $a : b = 5 : 2$ and $b : c = 3 : 4$

Find the ratio $a : b : c$.

Give your answer in its simplest form.

WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(2 marks)

The ratio of cars to vans in a car park is $8 : 2$.

The ratio of motorbikes to cars is $9 : 3$.

Find the ratio of vans to motorbikes. Give your answer in its simplest form.

WORKING OUT SPACE

Answer:

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

The points A , B , C and D lie in order on a straight line.

$$AB : BD = 1 : 4 \quad \text{and} \quad AC : CD = 3 : 7$$

Find $AB : BC : CD$.

Give your answer in its simplest form.

WORKING OUT SPACE

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

There are red sweets, blue sweets and green sweets in a bag.

The ratio of red sweets to sweets that are not red is $2 : 3$.

The ratio of green sweets to sweets that are not green is $6 : 19$.

Work out the ratio of red sweets to blue sweets to green sweets.

Give your answer in its simplest form.

WORKING OUT SPACE

Answer:

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

Jack and Kyle share some stickers in the ratio 3:5.

Jack gets J stickers, Kyle gets K stickers.

Luke and Max share the same amount of stickers as Jack and Kyle.

They share their stickers in the ratio 1:3.

Luke gets L stickers, Max gets M stickers.

Find J:K:L:M.

Give your answer in its simplest form.

WORKING OUT SPACE

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

Given that $x : y = 3 : 4$ and $y : z = 6 : 5$, work out the fraction $\frac{x}{x + y + z}$ in its simplest form.

WORKING OUT SPACE

Answer:

Linear Direct Proportion

EDEXCEL GCSE EXAM PRACTICE**Total: 14 marks**

Linear Direct Proportion — 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)**

y is directly proportional to x . When $x = 2$, $y = 16$.

Find the value of y when $x = 11$.

WORKING OUT SPACE

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

y is directly proportional to x . When $x = 10$, $y = 50$.

Find the value of x when $y = 85$.

WORKING OUT SPACE

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

y is directly proportional to x . When $x = 8$, $y = 32$.

Find the value of y when $x = 16$.

WORKING OUT SPACE

Answer:

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

The extension, E cm, of a spring is directly proportional to the mass, m kg, hanging from it.
When $m = 4$, $E = 9$. Work out the value of m when $E = 29.25$.

WORKING OUT SPACE

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

y is directly proportional to x . Complete the table of values below to find b and a :

x	4	6	a
y	14	b	38.5

WORKING OUT SPACE

 $b =$ $a =$ **Question 6** **Calculator****(3 marks)**

The cost, $\pounds C$, of hiring a hall is directly proportional to the number of hours, h , it is hired for.
Hiring the hall for 3.5 hours costs $\pounds 147$.
Work out how many hours the hall was hired for if the total cost was $\pounds 273$.

WORKING OUT SPACE

Answer:

Direct & Inverse Prop

EDEXCEL GCSE EXAM PRACTICE**Total: 15 marks**

Direct & Inverse Prop — 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 machine fills 1500 leaflets in 5 hours.

Work out how many hours it would take the machine to fill 2400 leaflets.

WORKING OUT SPACE

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

A machine fills 900 cartons in 3 hours.

Work out how many hours it would take the machine to fill 2100 cartons.

WORKING OUT SPACE

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

It takes 6 decorators 5 days to paint an office block.

Work out how many days it would take 10 decorators to paint the same office block, working at the same rate.

WORKING OUT SPACE

Answer:

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

It takes 4 identical pumps 9 hours to drain a flooded quarry.

Work out how many **more** identical pumps are needed to drain the quarry in 6 hours.

WORKING OUT SPACE

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

y is inversely proportional to x . When $x = 12$, $y = 15$.

Find a formula for y in terms of x , and hence work out the value of y when $x = 9$.

WORKING OUT SPACE

Formula: $y =$ **When $x = 9$, $y =$** **Question 6** **Calculator****(3 marks)**

5 machines working for 8 hours a day can pack 1,200 boxes.

Work out how many boxes 7 of these machines can pack when working for 6 hours a day.

WORKING OUT SPACE

Answer:

Speed, Distance, Time

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

Speed, Distance, Time — 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 train travels at an average speed of 60 mph for 1 hour and 30 minutes.
Work out the distance travelled.

WORKING OUT SPACE

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

A cyclist travels 75 miles at an average speed of 50 mph.
Work out how long the journey takes.
Give your answer in hours and minutes.

WORKING OUT SPACE

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

Liam leaves his cottage at 08:20.
He drives 105 miles to the coast at an average speed of 60 mph.

At what time does Liam arrive?

WORKING OUT SPACE

Answer:

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

Nadia catches a train at 09:15 and arrives at her destination at 11:45.
The train travels a distance of 195 miles.

Work out the average speed of the train in mph.

WORKING OUT SPACE

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

Emma drives 231 miles from Cardiff to Southampton.
She drives the first 180 miles at an average speed of 60 mph.
From this point it takes Emma 1 hour and 12 minutes to complete the journey.

What was Emma's average speed for the whole journey?

WORKING OUT SPACE

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

Hassan travels from Glasgow to Inverness at an average speed of 60 mph.
The journey takes him 2 hours and 15 minutes.

Ronan makes the same journey in 2 hours and 30 minutes.

Work out Ronan's average speed for the journey.

WORKING OUT SPACE

Answer:

Density, Mass, Volume

EDEXCEL GCSE EXAM PRACTICE**Total: 14 marks**

Density, Mass, Volume — 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 piece of metal has a mass of 100 grams and a volume of 40 cm^3 .
Work out the density of the metal.

WORKING OUT SPACE

Answer:

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

A rock has a mass of 96 grams and a density of 3.2 g/cm^3 .
Work out the volume of the rock.

WORKING OUT SPACE

Answer:

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

A liquid has a density of 0.8 g/cm^3 .
Find the mass of 50 cm^3 of the liquid.

WORKING OUT SPACE

Answer:

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

50 cm^3 of Liquid A and 150 cm^3 of Liquid B are mixed together to make Liquid C.

Liquid A has a density of 2.0 g/cm^3 .

Liquid B has a density of 1.0 g/cm^3 .

Work out the density of Liquid C.

WORKING OUT SPACE

Answer:

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

A solid metal triangular prism has a cross-sectional area of 25 cm^2 and a length of 18 cm.

The prism has a mass of 3.825 kg.

Work out the density of the metal in g/cm^3 .

WORKING OUT SPACE

Answer:

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

Juice A has a density of 1.4 g/cm^3 .

80 cm^3 of Juice A is mixed with Juice B to make Drink C.

Drink C has a mass of 232 g and a density of 1.16 g/cm^3 .

Find the density of Juice B.

WORKING OUT SPACE

Answer:

Pressure, Force, Area

EDEXCEL GCSE EXAM PRACTICE**Total: 14 marks**

Pressure, Force, 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****(2 marks)**

A concrete slab exerts a force of 120 Newtons on the ground.
The slab has an area of 10 m^2 .

Work out the pressure on the ground.

WORKING OUT SPACE

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

A marble statue exerts a force of 60 Newtons on a plinth.
The pressure on the plinth is 30 N/m^2 .

Work out the area of the statue that is in contact with the plinth.

WORKING OUT SPACE

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

A shipping container exerts a pressure of 25 N/m^2 on the floor.
The container has an area of 2 m^2 .

Work out the force exerted by the container.

WORKING OUT SPACE

Answer:

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

A granite boulder exerts a force of 135 Newtons on the ground.
The boulder has a base area of 6 m^2 .

Work out the pressure on the ground.

WORKING OUT SPACE

Answer:

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

A solid metal cylinder has a radius of 0.5 m and exerts a force of $1,570 \text{ N}$ when resting flat on its circular base on horizontal ground.

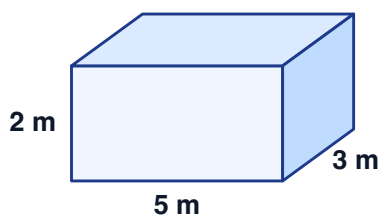
Work out the pressure exerted by the cylinder on the ground, in N/m^2 . Give your answer correct to 3 significant figures.

WORKING OUT SPACE

Answer:

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

A solid rectangular block has dimensions 2 m by 3 m by 5 m and a weight of $4,500 \text{ N}$.



Work out the **greatest** possible pressure the block can exert when resting on one of its flat rectangular faces on horizontal ground, in N/m^2 .

WORKING OUT SPACE

Answer:

Sector Area & Arc Length

EDEXCEL GCSE EXAM PRACTICE

Total: 15 marks

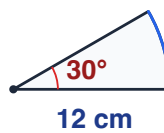
Sector Area & Arc Length — Practice Questions

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 sector of a circle with radius 12 cm and angle 30° .



Calculate the length of the arc in terms of π .

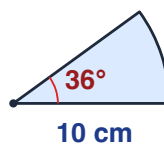
WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(2 marks)

The diagram shows a shaded sector of a circle with radius 10 cm and angle 36° .



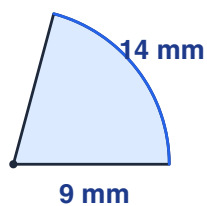
Calculate the area of the sector in terms of π .

WORKING OUT SPACE

Answer:

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

The diagram shows a sector with radius 9 mm and curved arc length 14 mm.



Work out the total perimeter of the sector.

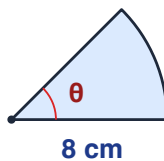
WORKING OUT SPACE

Answer:

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

The diagram shows a sector with radius 8 cm and area $8\pi \text{ cm}^2$.

$$\text{Area} = 8\pi \text{ cm}^2$$



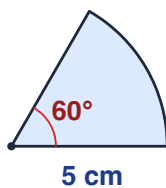
Find the angle θ of the sector.

WORKING OUT SPACE

Answer:

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

The diagram shows a sector of a circle with radius 5 cm and angle 60° .



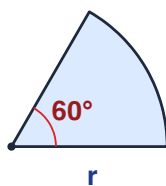
Calculate the total perimeter of the sector. Give your answer correct to 1 decimal place.

WORKING OUT SPACE

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

The diagram shows a 60° sector with area $6\pi \text{ cm}^2$.

$$\text{Area} = 6\pi \text{ cm}^2$$



Work out the radius r of the sector.

WORKING OUT SPACE

Answer:

Enlargements

EDEXCEL GCSE EXAM PRACTICE

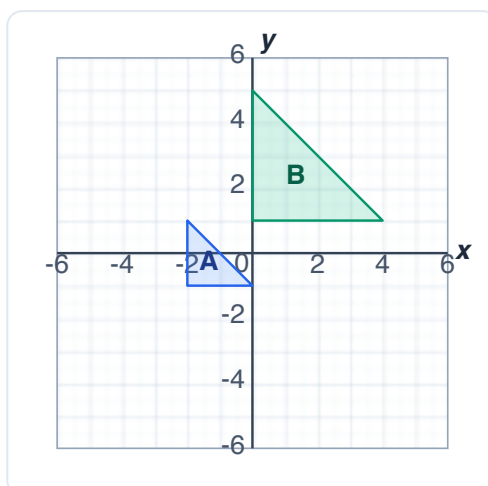
Total: 15 marks

Enlargements — 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 is enlarged by scale factor 2 to give Shape B , as shown on the coordinate grid below.



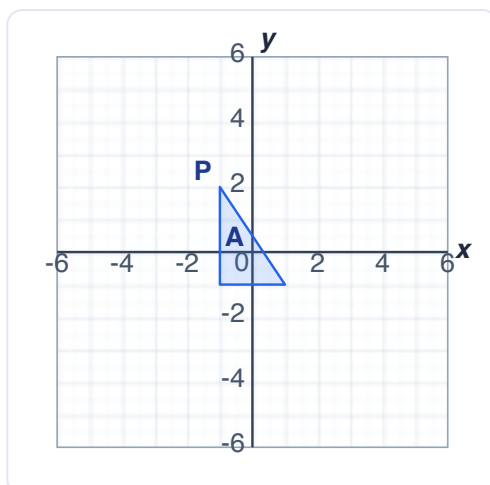
Write down the coordinates of the centre of enlargement.

WORKING OUT SPACE

Answer:

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

Triangle A is drawn on the coordinate grid below.



On the grid above, draw the enlargement of Triangle A by scale factor 2 with centre of enlargement at the point $C(-3, -2)$.

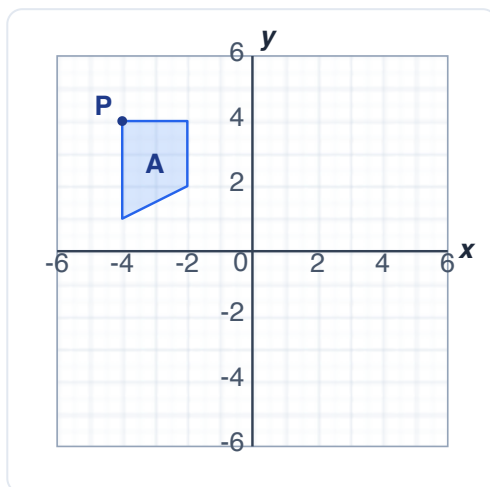
Write down the coordinates of the image of vertex P .

WORKING OUT SPACE

Answer:

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

Trapezium A has vertices $(-4, 1)$, $(-2, 2)$, $(-2, 4)$, and $P(-4, 4)$, as drawn on the coordinate grid below.



On the grid above, draw the enlargement of Trapezium A by scale factor 1.5 with centre of enlargement at the origin $(0, 0)$.

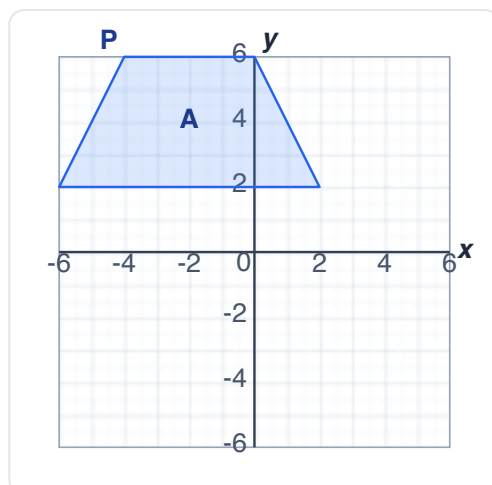
Write down the coordinates of the image of vertex P .

WORKING OUT SPACE

Answer:

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

Trapezium A is drawn on the coordinate grid below.



On the grid above, draw the enlargement of Trapezium A by scale factor $\frac{1}{2}$ with centre of enlargement at the origin $(0, 0)$.

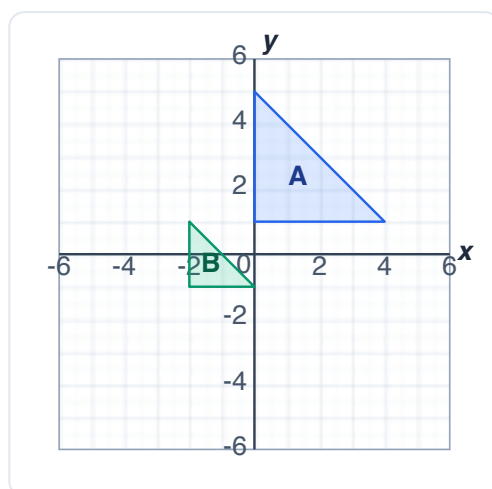
Write down the coordinates of the image of vertex P .

WORKING OUT SPACE

Answer:

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

Shape A is enlarged to give the smaller Shape B , as shown on the coordinate grid below.



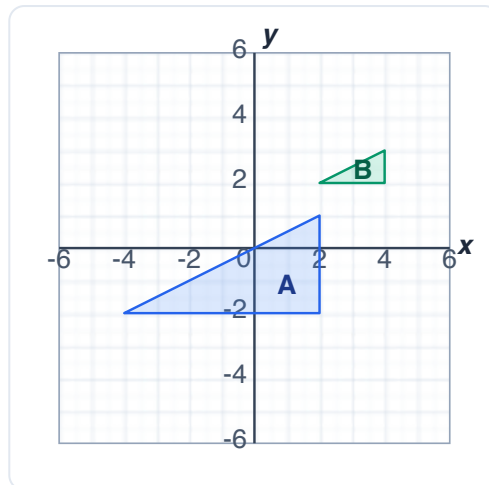
Find the fractional scale factor of the enlargement that maps Shape A onto Shape B . Give your answer as a simplified fraction.

WORKING OUT SPACE

Answer:

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

Shape A is enlarged by scale factor $\frac{1}{3}$ to give Shape B , as shown on the coordinate grid below.



Write down the coordinates of the centre of enlargement.

WORKING OUT SPACE

Answer:

Vectors

EDEXCEL GCSE EXAM PRACTICE

Total: 16 marks

Vectors — 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)

Let $\mathbf{a} = \begin{pmatrix} -4 \\ 3 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} -8 \\ 0 \end{pmatrix}$.

Work out $3\mathbf{a} - 3\mathbf{b}$ as a column vector.

WORKING OUT SPACE

Answer:

Question 2 ✗ Non-Calculator
(2 marks)

A is the point $(-7, 4)$ and B is the point $(-7, 2)$.

Write down as a column vector $\vec{AB}$.

WORKING OUT SPACE

Answer:

Question 3 ✗ Non-Calculator
(3 marks)

In triangle OAB , $\vec{OA} = 14\mathbf{a}$ and $\vec{OB} = 8\mathbf{b}$.

M is the midpoint of AB .

Find, in terms of $\mathbf{a}$ and $\mathbf{b}$, the vector $\vec{OM}$.

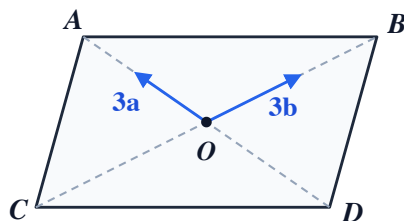
WORKING OUT SPACE

Answer:

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

The diagram shows a parallelogram $ABDC$ whose diagonals AD and CB intersect at O .

$$\overrightarrow{OA} = 3\mathbf{a} \text{ and } \overrightarrow{OB} = 3\mathbf{b}.$$



Find, in terms of $\mathbf{a}$ and $\mathbf{b}$, the vector $\overrightarrow{AB}$.

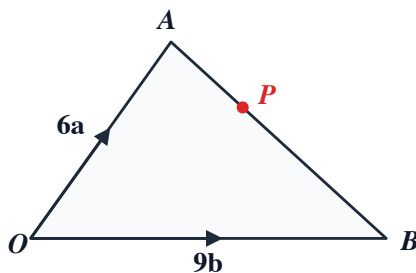
WORKING OUT SPACE

Answer:

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

In triangle OAB , $\overrightarrow{OA} = 6\mathbf{a}$ and $\overrightarrow{OB} = 9\mathbf{b}$.

P is the point on AB such that $AP : PB = 1 : 2$.



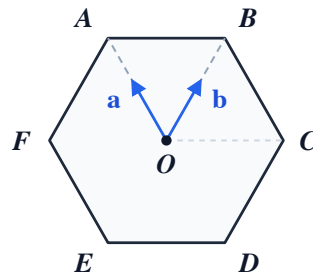
Find, in terms of $\mathbf{a}$ and $\mathbf{b}$, the vector $\overrightarrow{OP}$ in its simplest form.

WORKING OUT SPACE

Answer:

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

$ABCDEF$ is a regular hexagon with centre O , where $\vec{OA} = \mathbf{a}$ and $\vec{OB} = \mathbf{b}$.



Find, in terms of $\mathbf{a}$ and $\mathbf{b}$, the vectors (a) $\vec{AB}$ and (b) $\vec{AC}$.

WORKING OUT SPACE

(a) $\vec{AB} = \dots\dots\dots$ (b) $\vec{AC} = \dots\dots\dots$

Spheres and Cones

EDEXCEL GCSE EXAM PRACTICE

Total: 21 marks

Spheres and Cones — 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****(4 marks)**

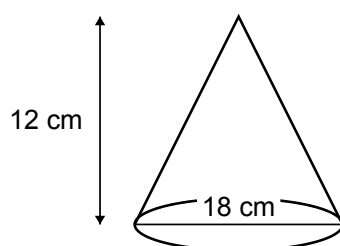
The diagram shows a solid cone.

The height of the cone is 12 cm.

The base of the cone has a diameter of 18 cm.

Work out the total surface area of the cone.

Give your answer in terms of π .



WORKING OUT SPACE

Answer:

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

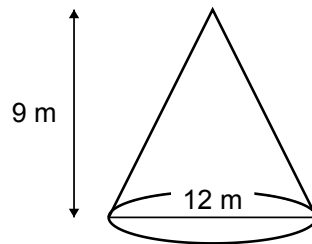
The diagram shows a cone.

The height of the cone is 9 m.

The base of the cone has a diameter of 12 m.

Work out the volume of the cone.

Give your answer correct to 3 significant figures.



WORKING OUT SPACE

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

The diagram shows a solid shape.

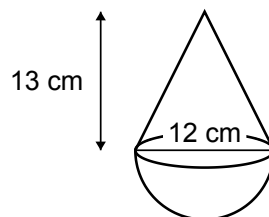
The shape is a cone on top of a hemisphere.

The height of the cone is 13 cm.

The diameter of the hemisphere is 12 cm.

Work out the total volume of the solid shape.

Give your answer in terms of π .



WORKING OUT SPACE

Answer:

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

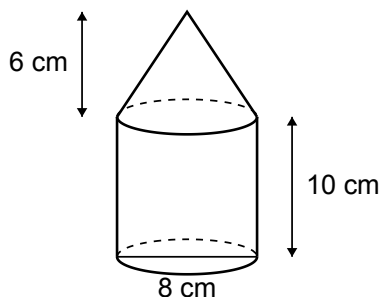
The diagram shows a solid shape made from a cone on top of a cylinder.

The cylinder has diameter 8 cm and height 10 cm.

The cone has height 6 cm.

Work out the total volume of the solid shape.

Give your answer in terms of π .



WORKING OUT SPACE

Answer:

Question 5 🧮 Calculator**(4 marks)**

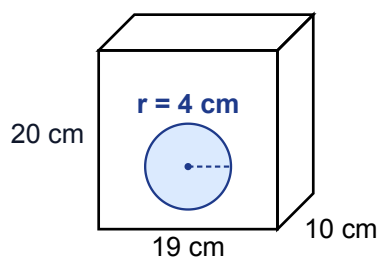
A rectangular container is 19 cm long, 10 cm wide and 20 cm high.

The glass tank is partly filled with water.

A heavy metal sphere of radius 4 cm is lowered into the water until it is completely submerged.

Work out the increase in the water level.

Give your answer correct to 3 significant figures.



WORKING OUT SPACE

Answer:

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

A sphere and a cube have the same volume.

The cube has a length of 8 cm.

Work out the radius of the sphere.

Give your answer correct to 3 significant figures.

WORKING OUT SPACE**Answer:**

Congruent Triangles

EDEXCEL GCSE EXAM PRACTICE

Total: 10 marks

Congruent Triangles — Practice Questions

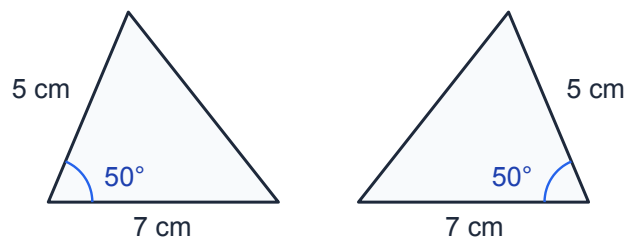
Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 Non-Calculator

(1 mark)

The diagram shows a pair of congruent triangles.

State the condition for congruence (**SSS**, **SAS**, **ASA**, or **RHS**) that proves they are congruent.



WORKING OUT SPACE

Answer:

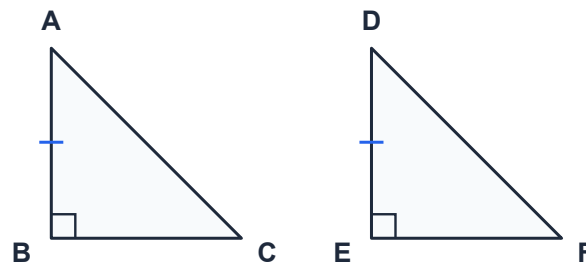
Question 2 Non-Calculator

(1 mark)

You want to prove that triangle ABC is congruent to triangle DEF using the **RHS** condition.

As marked on the diagram, you are already given that angles $\angle B = \angle E = 90^\circ$ and sides $AB = DE$.

What additional piece of information is required?



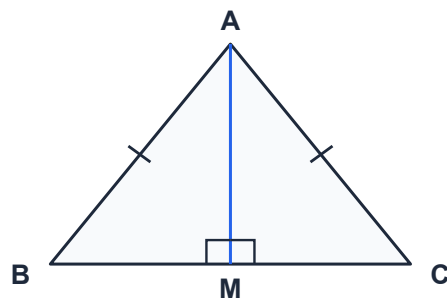
WORKING OUT SPACE

Answer:

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

In the diagram below, $AB = AC$ and AM is perpendicular to BC .

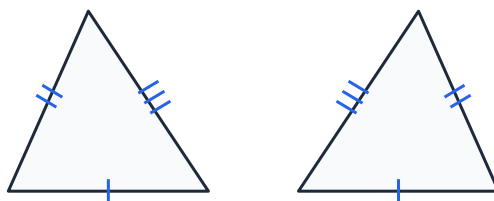
State the congruence condition that proves triangle ABM is congruent to triangle ACM .



WORKING OUT SPACE

Answer:**Question 4** ✎ Non-Calculator**(1 mark)**

Based on the tick marks and angle arcs in the diagram, state the condition (**SSS**, **SAS**, **ASA**, or **RHS**) that proves these two triangles are congruent.

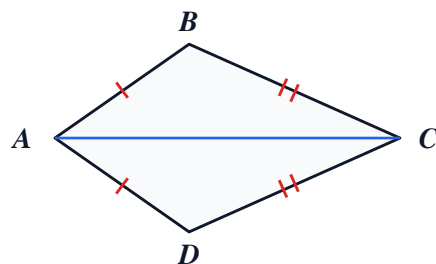


WORKING OUT SPACE

Answer:

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

In the kite $ABCD$, $AB = AD$ and $BC = DC$.

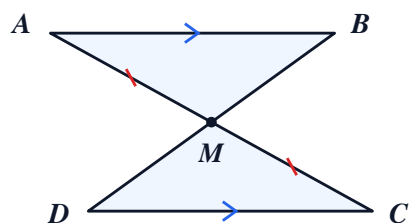


Prove that triangle ABC is congruent to triangle ADC .

WORKING & PROOF SPACE

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

In the diagram, AB is parallel to DC , and M is the midpoint of AC .



Prove that triangle ABM is congruent to triangle CDM .

WORKING & PROOF SPACE

Trigonometry Exact Values

EDEXCEL GCSE EXAM PRACTICE

Total: 9 marks

Trigonometry Exact Values — 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)

Write down the exact value of $\tan(45^\circ)$

WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(1 mark)

Write down the exact value of $\sin(60^\circ)$

WORKING OUT SPACE

Answer:

Question 3 ☒ Non-Calculator

(1 mark)

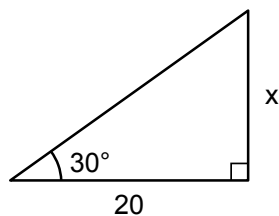
Write down the exact value of $\cos(90^\circ)$

WORKING OUT SPACE

Answer:

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

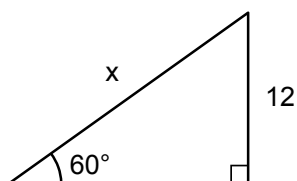
Calculate the length x . Give your answer in exact form (as a surd or integer if appropriate).



WORKING OUT SPACE

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

Calculate the length x . Give your answer in exact form (as a surd or integer if appropriate).

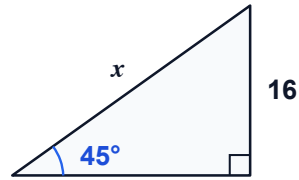


WORKING OUT SPACE

Answer:

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

Calculate the length x . Give your answer in exact form (as a surd or integer if appropriate).



WORKING OUT SPACE

Answer:

SOHCAHTOA

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

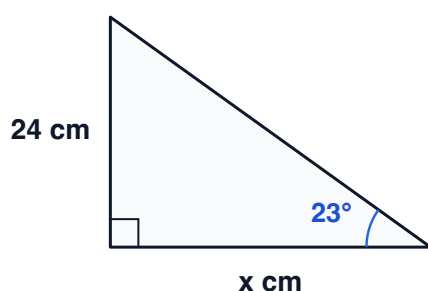
SOHCAHTOA — Practice Questions

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)**

Work out the value of x .

Give your answer to 1 decimal place.



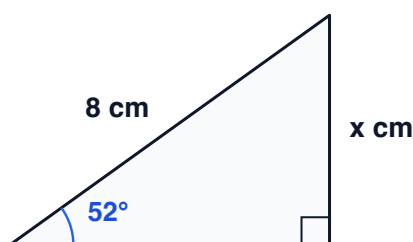
WORKING OUT SPACE

Answer:

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

Work out the value of x .

Give your answer to 1 decimal place.

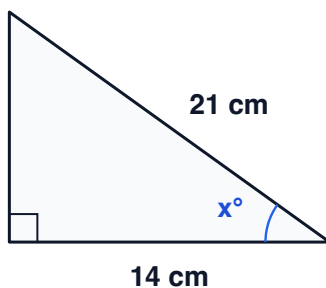


WORKING OUT SPACE

Answer:

Question 3 **Calculator****(2 marks)**Work out the value of x .

Give your answer to 1 decimal place.

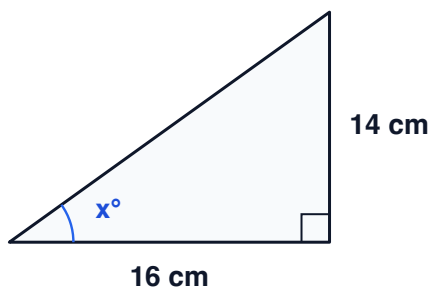


WORKING OUT SPACE

Answer:

Question 4 **Calculator****(2 marks)**Work out the value of x .

Give your answer to 1 decimal place.

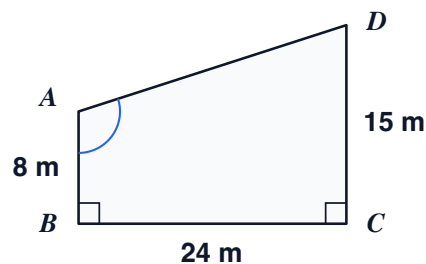


WORKING OUT SPACE

Answer:

Question 5 **Calculator****(4 marks)**Work out the size of obtuse angle BAD .

Give your answer to 1 decimal place.

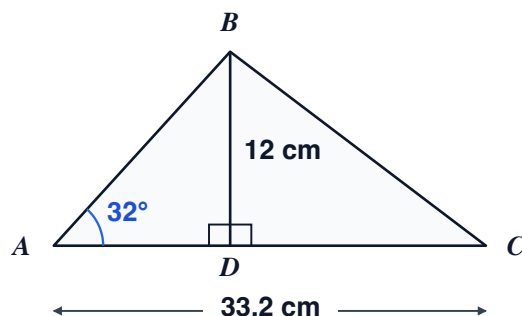


WORKING OUT SPACE

Answer:

Question 6 **Calculator****(4 marks)**Work out the size of angle BCD .

Give your answer correct to 1 decimal place.



WORKING OUT SPACE

Answer:

Venn Diagrams

EDEXCEL GCSE EXAM PRACTICE

Total: 14 marks

Venn Diagrams — 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)

$$\mathcal{E} = \{\text{integers from 1 to 17}\}$$

$$A = \{2, 8, 9, 14\}$$

$$B = \{3, 11, 13, 14\}$$

List the members of $A \cap B$.

WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(2 marks)

$$\mathcal{E} = \{\text{integers from 1 to 10}\}$$

$$A = \{3, 5, 7, 8, 9, 10\}$$

$$B = \{1, 2, 3, 4, 9, 10\}$$

A number is chosen at random from the universal set $\mathcal{E}$.
Find the probability that the number is in the set $A \cap B$.

WORKING OUT SPACE

Answer:

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

Out of 76 people surveyed:

57 chose music

18 chose rugby

6 chose BOTH music and rugby.

How many people chose NEITHER music nor rugby?

WORKING OUT SPACE

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

Out of 69 people surveyed:

48 chose history

19 chose drama

7 chose BOTH history and drama.

How many people chose ONLY history?

WORKING OUT SPACE

Answer:

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

Arjun asked 92 people which things they liked from Maths, English, and Science.

- 10 people like all three.
- 13 people like Maths and English.
- 18 people like English and Science.
- 13 people like Maths and Science.
- 31 people like Maths.
- 35 people like English.
- 58 people like Science.

How many people liked NEITHER Maths, English, nor Science?

WORKING OUT SPACE

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

Arjun asked 50 people which things they liked from tea, coffee, and milk.

2 people like none of these.

- 10 people like all three.
- 2 people like tea and coffee but NOT milk.
- 18 people like coffee and milk.
- 13 people like tea and milk.
- 26 people like tea.
- 33 people like coffee.
- 22 people like milk.

Arjun selects one person at random. Using a Venn diagram, work out the probability that this person likes **Coffee only**.

WORKING OUT SPACE

Answer:

Probability Trees

EDEXCEL GCSE EXAM PRACTICE

Total: 16 marks

Probability 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****(3 marks)**

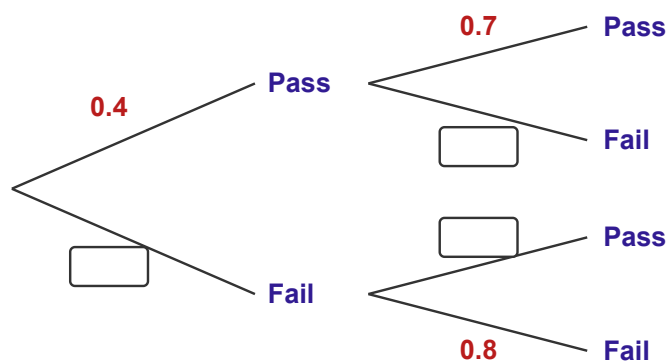
The probability that a student passes the Theory test is 0.4.

If they pass the Theory test, the probability that they pass the Practical test is 0.7.

If they fail the Theory test, the probability that they fail the Practical test is 0.8.

(a) Complete the probability tree diagram.

(b) Work out the probability that the student passes both tests.

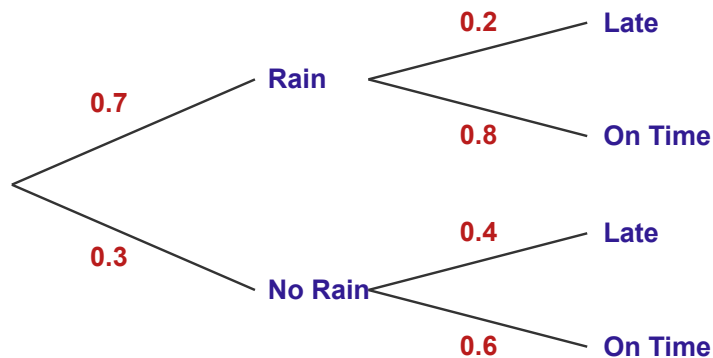


WORKING OUT SPACE

Answer:

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

Here is a probability tree diagram.
Find the probability of (Rain AND Late).



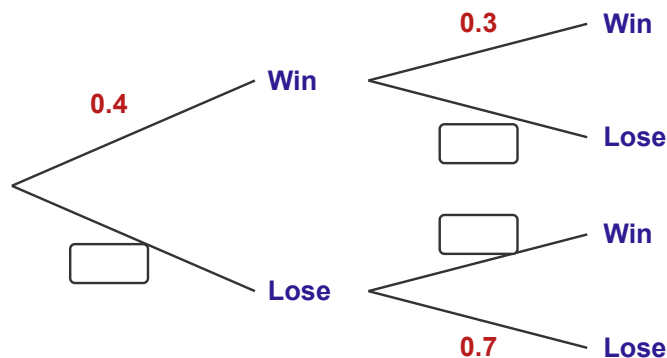
WORKING OUT SPACE

Answer:

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

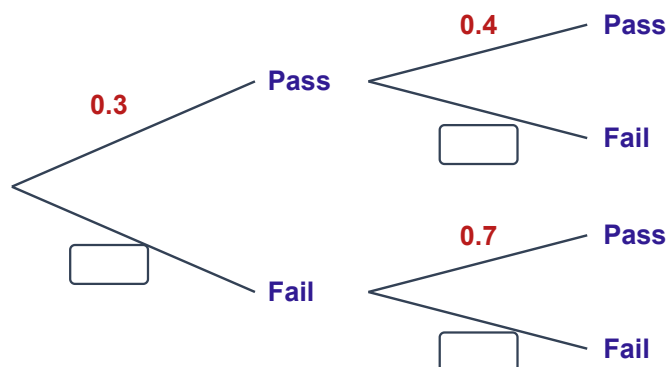
Amir plays two games of chess.
The probability that he wins the first game is 0.4.
The probability that he wins the second game is 0.3.

- (a) Complete the probability tree diagram.
(b) Work out the probability that Amir wins **exactly one** game.

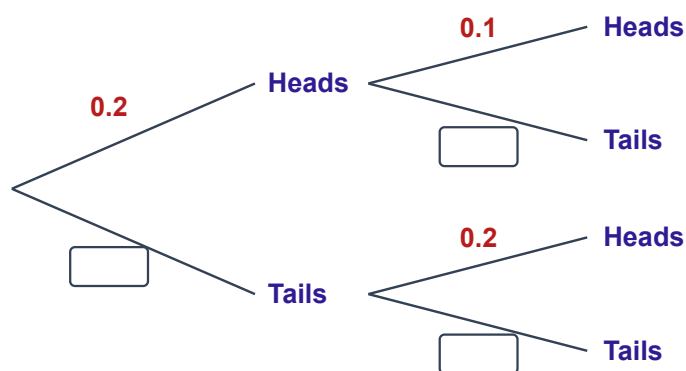


WORKING OUT SPACE

Answer:

Question 4 **Non-Calculator****(3 marks)****(a)** Complete the probability tree diagram below.**(b)** Work out the probability of getting **exactly one** Pass and one Fail.

WORKING OUT SPACE

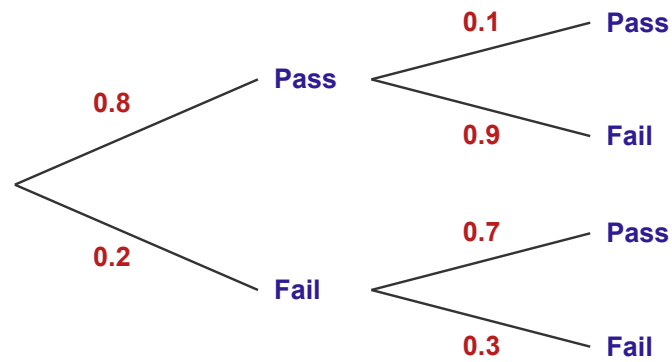
(b) Answer:**Question 5** **Non-Calculator****(3 marks)****(a)** Complete the probability tree diagram below.**(b)** Work out the probability of getting **at least one** Heads.

WORKING OUT SPACE

(b) Answer:

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

Here is a probability tree diagram.
Find the probability of at least one Pass.



WORKING OUT SPACE

Answer:

EDEXCEL GCSE PAPER 1 — NON-CALCULATOR (GRADE 5 CROSSOVER)

Mixed Review 1 of 2

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

Total: 45 marks

These 15 unseen Grade 5 crossover questions are mixed across topics with no topic headings — just like a real Edexcel Paper 1 exam.

Question 1 ☒ Non-Calculator

(2 marks)

Work out $(4.5 \times 10^6) \div (9 \times 10^{-2})$.
Give your answer in standard form.

WORKING OUT SPACE

Answer:

Question 2 ☒ Non-Calculator

(3 marks)

In a sale, all normal prices are reduced by 20%.
The sale price of a microwave is £136.
Work out the normal price of the microwave before the sale.

WORKING OUT SPACE

Answer:

Question 3 ☒ Non-Calculator

(3 marks)

Make t the subject of the formula:

$$v = \frac{3t - 8}{5}$$

WORKING OUT SPACE

Answer:

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

(a) Factorise $x^2 - 5x - 24$.

(b) Hence solve $x^2 - 5x - 24 = 0$.

WORKING OUT SPACE

(a) (b) $x =$ **Question 5** Non-Calculator**(3 marks)**

Given that $a : b = 2 : 3$ and $b : c = 4 : 5$, find the ratio $a : b : c$ in its simplest form.

WORKING OUT SPACE

Answer:

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

Find the equation of the straight line that is parallel to $y = 3x - 7$ and passes through the point $(-2, 5)$.

Give your answer in the form $y = mx + c$.

WORKING OUT SPACE

Answer:

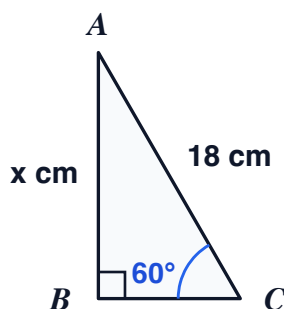
Question 7 Non-Calculator**(3 marks)**

It takes 8 workers 6 days to build a boundary wall.

Work out how many days it would take 12 workers to build the same wall, working at the same rate.

WORKING OUT SPACE

Answer:

Question 8 Non-Calculator**(3 marks)**

In right-angled triangle ABC , angle $ABC = 90^\circ$, angle $ACB = 60^\circ$, and $AC = 18$ cm.

Work out the exact length of side AB (x). Give your answer in the form $k\sqrt{3}$, where k is an integer.

WORKING OUT SPACE

Answer:

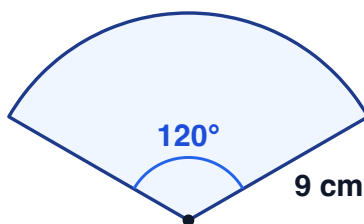
Question 9 Non-Calculator**(3 marks)**

Solve the simultaneous equations:

$$3x + 2y = 19$$

$$2x - y = 8$$

WORKING OUT SPACE

 $x = \dots\dots\dots$ $y = \dots\dots\dots$ **Question 10** Non-Calculator**(3 marks)**

The diagram shows a sector of a circle with radius 9 cm and angle 120° .

Work out the total perimeter of the sector. Give your answer in the form $a\pi + b$, where a and b are integers.

WORKING OUT SPACE

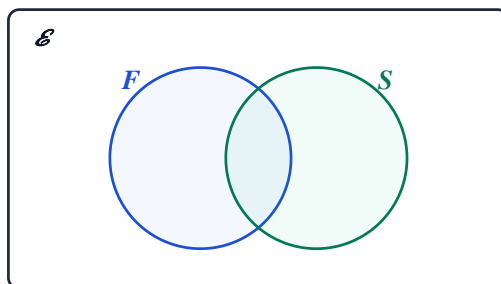
Answer:

Question 11 **Non-Calculator****(4 marks)**

Out of 60 students in Year 11:

- 34 study French (F)
- 28 study Spanish (S)
- 10 study both French and Spanish.

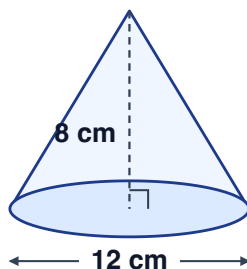
(a) Complete the Venn diagram below to show this information.



(b) A student is chosen at random from the 60 students. Work out the probability that the student studies French only. Give your answer as a simplified fraction.

WORKING OUT SPACE

(b) Answer:

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

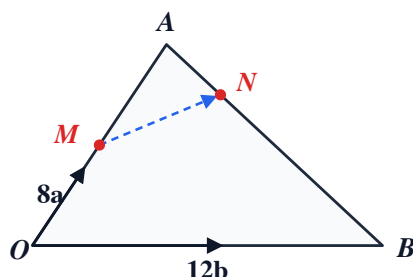
A solid cone has a base diameter of 12 cm and a vertical height of 8 cm.

Work out the total surface area of the solid cone. Give your answer in terms of π .

(Curved surface area of a cone = πrl)

WORKING OUT SPACE

Answer:

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

In triangle OAB , $\vec{OA} = 8\mathbf{a}$ and $\vec{OB} = 12\mathbf{b}$.

M is the midpoint of OA , and N is the point on AB such that $AN : NB = 1 : 3$.

Find, in terms of $\mathbf{a}$ and $\mathbf{b}$, the vector $\vec{MN}$ in its simplest form.

WORKING OUT SPACE

Answer:

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

A solid metal cuboid measures 4 cm by 5 cm by 10 cm.

The cuboid has a mass of 1.7 kg.

Work out the density of the metal in g/cm^3 .

WORKING OUT SPACE

Answer:

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

The probability that a biased coin lands on Heads is 0.3.

The coin is flipped twice.

Work out the probability that the coin lands on Heads at least once.

WORKING OUT SPACE

Answer:

EDEXCEL GCSE PAPER 2/3 — CALCULATOR (GRADE 5 CROSSOVER)

Mixed Review 2 of 2

Mixed Review 2 — Choosing the Right Method (Calculator)

Total: 45 marks

These 15 unseen Grade 5 crossover questions are interleaved across topics to test method selection under Calculator Paper 2/3 conditions.

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

Calculate $(6.4 \times 10^5) + (5.8 \times 10^4)$.
Give your answer in standard form.

WORKING OUT SPACE

Answer:

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

The value of a vintage watch increases by 12% to £1,512.
Work out the value of the watch before the increase.

WORKING OUT SPACE

Answer:

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

A train travels 135 km at an average speed of 90 km/h, and then travels a further 110 km in 1 hour 15 minutes.
Work out the average speed of the train for the whole 245 km journey, in km/h. Give your answer correct to 1 decimal place.

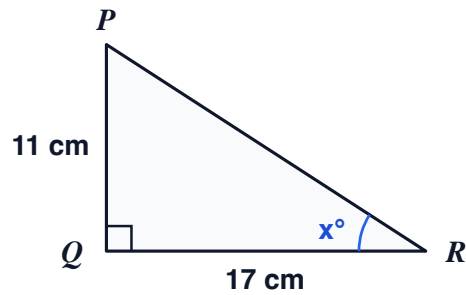
WORKING OUT SPACE

Answer:

Question 4

 Calculator

(3 marks)



Calculate the size of angle PRQ (x). Give your answer correct to 1 decimal place.

WORKING OUT SPACE

Answer:

Question 5

 Calculator

(3 marks)

In a school, the ratio of Key Stage 3 students to Key Stage 4 students is $7 : 5$.

20% of the Key Stage 3 students and 35% of the Key Stage 4 students travel to school by bus.

Work out the percentage of all the students in the school who travel by bus. Give your answer correct to 1 decimal place.

WORKING OUT SPACE

Answer:

Question 6

 Calculator

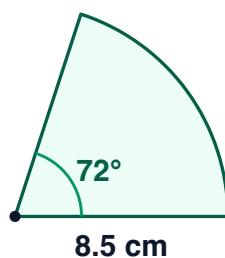
(3 marks)

y is directly proportional to x . When $x = 6$, $y = 27$.

Work out the value of x when $y = 63$.

WORKING OUT SPACE

Answer:

Question 7 **Calculator****(3 marks)**

Calculate the area of the sector with radius 8.5 cm and angle 72° .
Give your answer correct to 1 decimal place.

WORKING OUT SPACE

Answer:

Question 8 **Calculator****(4 marks)**

4 adult tickets and 3 child tickets for a theme park cost £159.
2 adult tickets and 5 child tickets cost £125.
Work out the cost of 1 adult ticket and the cost of 1 child ticket.

WORKING OUT SPACE

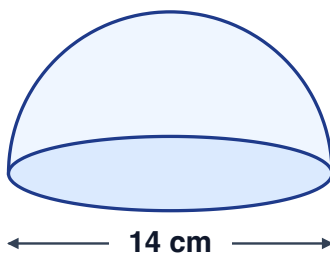
Adult ticket: £..... Child ticket: £.....

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

Liquid A has a density of 1.2 g/cm^3 and a volume of 150 cm^3 .
Liquid B has a density of 0.85 g/cm^3 and a volume of 250 cm^3 .
The two liquids are mixed together to make Liquid C.
Work out the density of Liquid C. Give your answer correct to 2 decimal places.

WORKING OUT SPACE

Answer:

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

Calculate the total surface area of a solid hemisphere with diameter 14 cm.

Give your answer correct to 1 decimal place.

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

WORKING OUT SPACE

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

The straight line L_1 has equation $y = 4x - 5$ and the straight line L_2 has equation $y = 13 - 2x$.

Work out the coordinates of the point where L_1 and L_2 intersect.

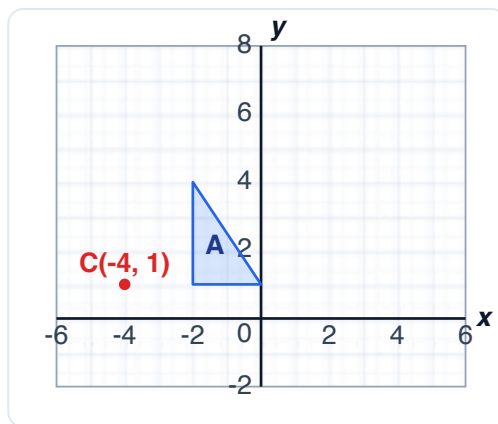
WORKING OUT SPACE

Answer:

Question 12

Calculator

(3 marks)



Triangle A has vertices at $(-2, 1)$, $(0, 1)$, and $(-2, 4)$.

Triangle A is enlarged by scale factor 2 about the centre of enlargement $C(-4, 1)$.

Write down the coordinates of the three vertices of the enlarged triangle.

WORKING OUT SPACE

Vertices: (..... ,), (..... ,), (..... ,)

Question 13

Calculator

(3 marks)

A cylindrical stone column has a base radius of 0.4 m and exerts a force of $9,600 \text{ N}$ on horizontal ground.

Work out the pressure exerted by the column on the ground, in N/m^2 . Give your answer correct to 3 significant figures.

WORKING OUT SPACE

Answer:

Question 14

Calculator

(3 marks)

The probability that it snows in a mountain village on Saturday is 0.25 .

If it snows on Saturday, the probability that it snows on Sunday is 0.6 .

If it does not snow on Saturday, the probability that it snows on Sunday is 0.12 .

Work out the probability that it snows on **exactly one** of the two days.

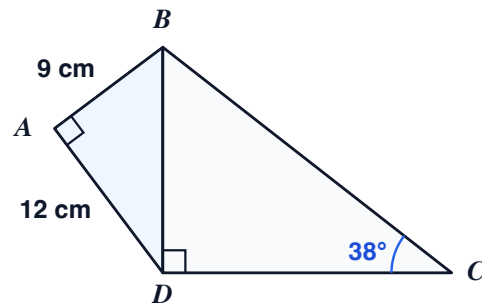
WORKING OUT SPACE

Answer:

Question 15

 Calculator

(3 marks)



In the diagram, angle $BAD = 90^\circ$ and angle $BDC = 90^\circ$.

$AB = 9$ cm, $AD = 12$ cm, and angle $BCD = 38^\circ$.

Calculate the length of BC . Give your answer correct to 1 decimal place.

WORKING OUT SPACE

Answer:

APPENDIX

Answers & Mark Schemes

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

Topic 1: Reverse Percentages

Q1 (Calc):	2200	[2m]
Q2 (Calc):	6	[2m]
Q3 (Calc):	550	[2m]
Q4 (Calc):	175	[2m]
Q5 (Calc):	150	[2m]
Q6 (Calc):	£21 (£140 – £119)	[3m]

Topic 2: Standard Form (Converting)

Q1 (Non-Calc):	3.8×10^5	[1m]
Q2 (Non-Calc):	4150000	[1m]
Q3 (Non-Calc):	5×10^6	[1m]
Q4 (Non-Calc):	5.76×10^{-3}	[1m]
Q5 (Non-Calc):	4.8×10^{-5}	[2m]
Q6 (Non-Calc):	$4.5 \times 10^3, 4.2 \times 10^4, 0.48 \times 10^5, 420,000$	[2m]

Topic 3: Standard Form (Calculating)

Q1 (Non-Calc):	3.6×10^5	[2m]
Q2 (Calc):	0.002278	[2m]
Q3 (Calc):	4.461×10^8	[2m]
Q4 (Non-Calc):	1.44×10^5	[2m]
Q5 (Non-Calc):	4.32×10^4	[2m]
Q6 (Non-Calc):	2.6×10^2	[2m]

Topic 4: Changing the Subject

Q1 (Non-Calc):	$\frac{A - 9}{3}$	[2m]
Q2 (Non-Calc):	$2y - 12$	[2m]
Q3 (Non-Calc):	$\frac{3m - 1}{5}$	[3m]
Q4 (Non-Calc):	$\frac{F}{P}$	[2m]
Q5 (Non-Calc):	$b = \frac{3a^2 + 5}{2}$	[3m]
Q6 (Non-Calc):	$\sqrt{\frac{y - 7}{2}}$	[3m]

Topic 5: Gradient of a Line

Q1 (Non-Calc):	3	[1m]
Q2 (Non-Calc):	3	[2m]
Q3 (Non-Calc):	-2	[2m]
Q4 (Non-Calc):	11	[3m]
Q5 (Non-Calc):	$y = -\frac{1}{2}x + 3$	[3m]
Q6 (Non-Calc):	$k = -4$	[3m]

Topic 6: Equation of a Line

Q1 (Non-Calc):	(a) 2, (b) 4	[2m]
Q2 (Non-Calc):	$y = 2x - 5$	[3m]
Q3 (Non-Calc):	4	[2m]
Q4 (Non-Calc):	$y = 2x + 2$	[2m]
Q5 (Non-Calc):	$y = 2x + 1$	[3m]
Q6 (Non-Calc):	$y = -2x + 11$	[4m]

Topic 7: Expanding & Factorising Quadratics

- Q1 (Non-Calc): $6x^2 + 7x - 3$ [2m]
 Q2 (Non-Calc): $x^2 - 11x + 18$ [2m]
 Q3 (Non-Calc): $(x + 2)(x + 7)$ [2m]
 Q4 (Non-Calc): $(x - 7)(x + 7)$ [2m]
 Q5 (Non-Calc): $(x - 9)(x - 4)$ [2m]
 Q6 (Non-Calc): $(x - 7)(x + 3)$ [2m]

Topic 8: Solving Quadratics by Factorising

- Q1 (Non-Calc): $-6, 5$ [1m]
 Q2 (Non-Calc): **(a)** $(y - 1)(y - 9)$, **(b)** $y = 1, 9$ [2m]
 Q3 (Non-Calc): $x = -12, -2$ [2m]
 Q4 (Non-Calc): $(3, -4)$ [1m]
 Q5 (Non-Calc): $x = -2$ [1m]
 Q6 (Non-Calc): $x = 4 (x^2 + 3x - 28 = 0)$ [4m]

Topic 9: Linear Simultaneous Equations

- Q1 (Non-Calc): $x = 5, y = 3$ [3m]
 Q2 (Non-Calc): $x = 4, y = 2$ [3m]
 Q3 (Non-Calc): $x = 3, y = 3$ [3m]
 Q4 (Non-Calc): **Small tin = 9, Large tin = 4** [4m]
 Q5 (Calc): **Peak = £7, Off-peak = £9** [4m]
 Q6 (Non-Calc): **Notebook = £3, Highlighter = £2** [4m]

Topic 10: Solving Equations Graphically

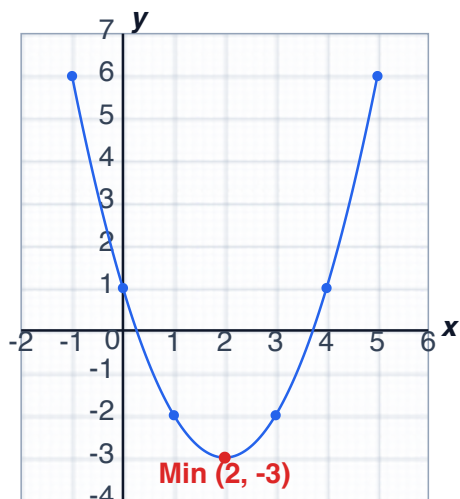
- Q1 (Non-Calc): $x = 3, y = 7$ [3m]
 Q2 (Non-Calc): $x = 1, y = -2$ [3m]
 Q3 (Non-Calc): $x = 3, y = 1$ [3m]
 Q4 (Non-Calc): $(-2, 3)$ [4m]
 Q5 (Non-Calc): $(2, 8)$ [4m]
 Q6 (Non-Calc): $(4, 14)$ [4m]

Topic 11: Quadratic, Cubic & Reciprocal Graphs

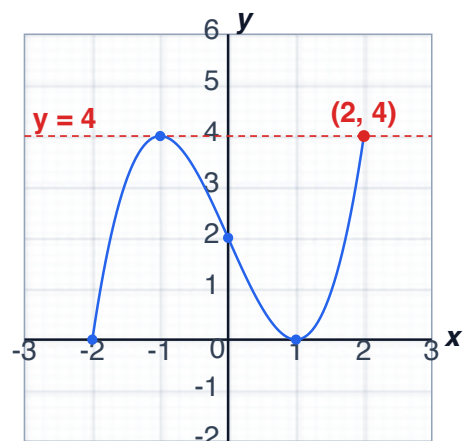
- Q1 (Non-Calc): **(i) Missing y : 6, -2, -3, 1, 6 | (ii) See graph below | (iii) (2, -3)** [4m]
 Q2 (Non-Calc): **3** [1m]
 Q3 (Non-Calc): **(i) Missing y : 0, 4, 0, 4 | (ii) See graph below | (iii) $x = 2$** [4m]
 Q4 (Non-Calc): **(i) Missing y : -1, -3, -6, 3, 2, 1 | (ii) See graph below | (iii) $x = 4$** [4m]
 Q5 (Non-Calc): **A** [1m]
 Q6 (Non-Calc): **D** [1m]

Q1 — Completed Table & Plotted Graph

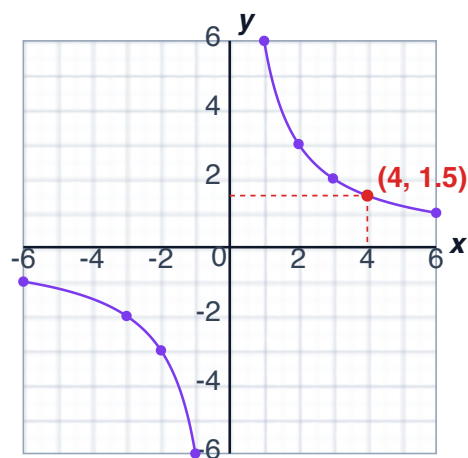
x	-1	0	1	2	3	4	5
y	6	1	-2	-3	-2	1	6

**Q3 — Completed Table & Plotted Graph**

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

**Q4 — Completed Table & Plotted Graph**

x	-6	-3	-2	-1	1	2	3	6
y	-1	-2	-3	-6	6	3	2	1



Topic 12: Ratio Contexts

Q1 (Non-Calc):	66	[3m]
Q2 (Non-Calc):	$\frac{5}{18}$	[3m]
Q3 (Calc):	140	[3m]
Q4 (Non-Calc):	8	[3m]
Q5 (Non-Calc):	105°	[3m]
Q6 (Calc):	2,100 g	[3m]

Topic 13: Ratios & Fractions

Q1 (Non-Calc):	$\frac{7}{12}$	[2m]
Q2 (Non-Calc):	3 : 5	[2m]
Q3 (Non-Calc):	$\frac{8}{25}$	[3m]
Q4 (Non-Calc):	60%	[3m]
Q5 (Non-Calc):	38%	[3m]
Q6 (Non-Calc):	24	[3m]

Topic 14: Combining Ratios

Q1 (Non-Calc):	15 : 6 : 8	[2m]
Q2 (Non-Calc):	1 : 12	[2m]
Q3 (Non-Calc):	2 : 1 : 7	[3m]
Q4 (Non-Calc):	10 : 9 : 6	[3m]
Q5 (Non-Calc):	3 : 5 : 2 : 6	[2m]
Q6 (Non-Calc):	$\frac{9}{31}$	[2m]

Topic 15: Linear Direct Proportion

Q1 (Non-Calc):	88	[2m]
Q2 (Non-Calc):	17	[2m]
Q3 (Non-Calc):	64	[2m]
Q4 (Calc):	13	[2m]
Q5 (Non-Calc):	$b = 21, a = 11$	[3m]
Q6 (Calc):	6.5 hours	[3m]

Topic 16: Direct & Inverse Prop

Q1 (Non-Calc):	8	[2m]
Q2 (Non-Calc):	7	[2m]
Q3 (Non-Calc):	3 days	[2m]
Q4 (Non-Calc):	2 more pumps (6 total)	[3m]
Q5 (Non-Calc):	$y = \frac{180}{x}; y = 20$	[3m]
Q6 (Calc):	1,260 boxes	[3m]

Topic 17: Speed, Distance, Time

Q1 (Non-Calc):	90	[2m]
Q2 (Non-Calc):	1h30m	[2m]
Q3 (Non-Calc):	10:05	[3m]
Q4 (Calc):	78	[3m]
Q5 (Calc):	55	[3m]
Q6 (Calc):	54	[3m]

Topic 18: Density, Mass, Volume

Q1 (Non-Calc):	2.5	[2m]
Q2 (Non-Calc):	30	[2m]
Q3 (Non-Calc):	40	[2m]
Q4 (Non-Calc):	1.25	[2m]
Q5 (Calc):	8.5 g/cm^3	[3m]
Q6 (Calc):	1	[3m]

Topic 19: Pressure, Force, Area

Q1 (Non-Calc):	12	[2m]
Q2 (Non-Calc):	2	[2m]
Q3 (Non-Calc):	50	[2m]
Q4 (Non-Calc):	22.5	[2m]
Q5 (Calc):	$2,000 \text{ N/m}^2$ (3 s.f.)	[3m]
Q6 (Non-Calc):	750 N/m^2	[3m]

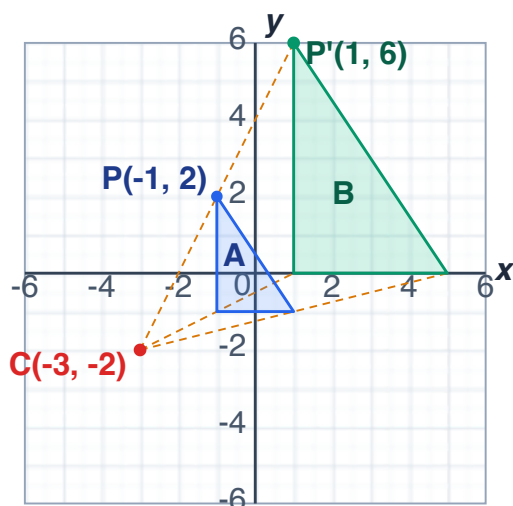
Topic 20: Sector Area & Arc Length

Q1 (Non-Calc):	2π	[2m]
Q2 (Non-Calc):	10π	[2m]
Q3 (Non-Calc):	32	[2m]
Q4 (Non-Calc):	45°	[3m]
Q5 (Calc):	15.2	[3m]
Q6 (Non-Calc):	6	[3m]

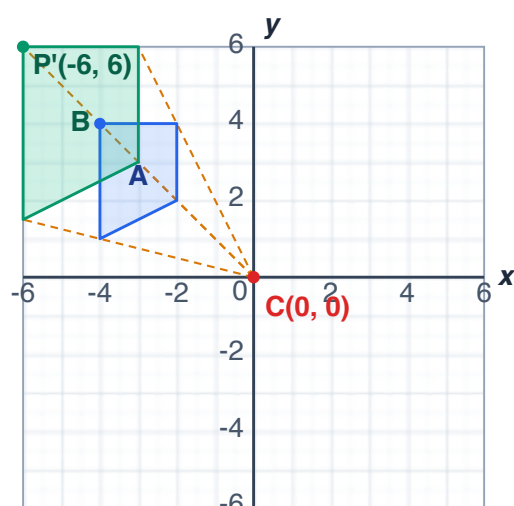
Topic 21: Enlargements

Q1 (Non-Calc):	$(-4, -3)$	[2m]
Q2 (Non-Calc):	Enlargement drawn (see diagram below) $P' = (1, 6)$	[3m]
Q3 (Non-Calc):	Enlargement drawn (see diagram below) $P' = (-6, 6)$	[3m]
Q4 (Non-Calc):	Enlargement drawn (see diagram below) $P' = (-2, 3)$	[3m]
Q5 (Non-Calc):	$\frac{1}{2}$	[2m]
Q6 (Non-Calc):	$(5, 4)$	[2m]

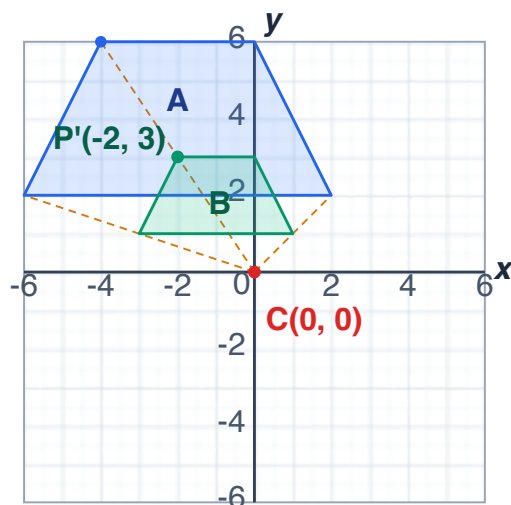
Q2 — Completed Enlargement Diagram



Q3 — Completed Enlargement Diagram



Q4 — Completed Enlargement Diagram



Topic 22: Vectors

Q1 (Non-Calc): $\begin{pmatrix} 12 \\ 9 \end{pmatrix}$ [2m]Q2 (Non-Calc): $\begin{pmatrix} 0 \\ -2 \end{pmatrix}$ [2m]Q3 (Non-Calc): $7\mathbf{a} + 4\mathbf{b}$ [3m]Q4 (Non-Calc): $-3\mathbf{a} + 3\mathbf{b}$ [3m]Q5 (Non-Calc): $4\mathbf{a} + 3\mathbf{b}$ [3m]Q6 (Non-Calc): $(\mathbf{a}) -\mathbf{a} + \mathbf{b}, (\mathbf{b}) -2\mathbf{a} + \mathbf{b}$ [3m]

Topic 23: Spheres and Cones

Q1 (Non-Calc): 216π [4m]Q2 (Calc): **339** [3m]Q3 (Non-Calc): 300π [3m]Q4 (Non-Calc): 192π [3m]Q5 (Calc): **1.41** [4m]Q6 (Calc): **4.96** [4m]

Topic 24: Congruent Triangles

Q1 (Non-Calc): **SAS** [1m]Q2 (Non-Calc): **AC = DF** [1m]Q3 (Non-Calc): **RHS** [1m]Q4 (Non-Calc): **SSS** [1m]Q5 (Non-Calc): **Proof: $AB = AD$, $BC = DC$ (given), AC common (SSS)** [3m]Q6 (Non-Calc): **Proof: $AM = CM$ (midpoint), $\angle BAM = \angle DCM$ (alt.), $\angle AMB = \angle CMD$ (vert. opp.) (ASA)** [3m]

Topic 25: Trigonometry Exact Values

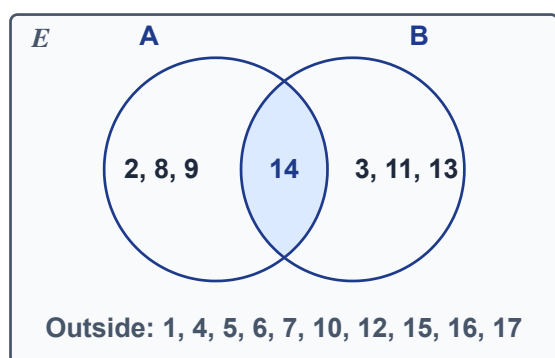
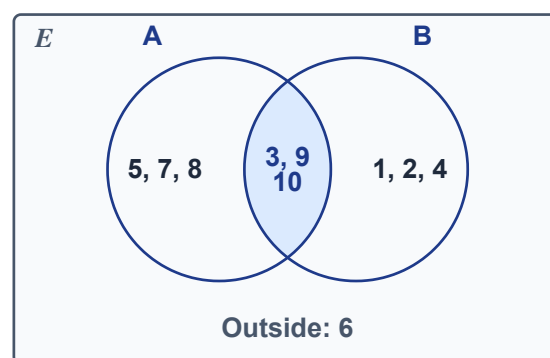
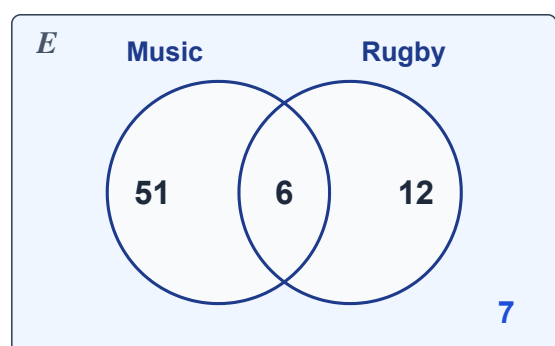
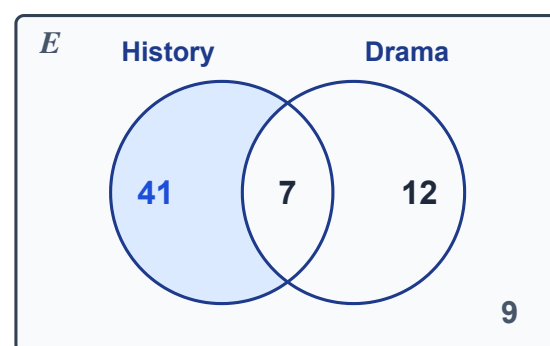
Q1 (Non-Calc): **1** [1m]Q2 (Non-Calc): $\frac{\sqrt{3}}{2}$ [1m]Q3 (Non-Calc): **0** [1m]Q4 (Non-Calc): $\frac{20\sqrt{3}}{3}$ [2m]Q5 (Non-Calc): $8\sqrt{3}$ [2m]Q6 (Non-Calc): $16\sqrt{2}$ [2m]

Topic 26: SOHCAHTOA

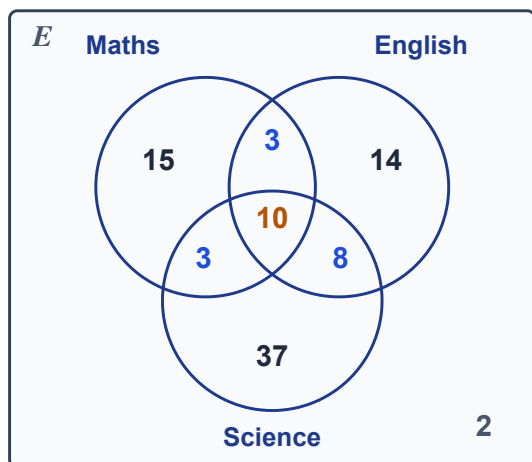
Q1 (Calc):	56.5	[2m]
Q2 (Calc):	6.3	[2m]
Q3 (Calc):	48.2	[2m]
Q4 (Calc):	41.2	[2m]
Q5 (Calc):	106.3	[4m]
Q6 (Calc):	40.6°	[4m]

Topic 27: Venn Diagrams

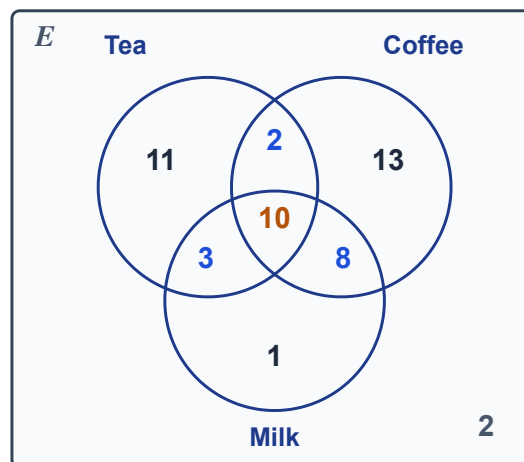
Q1 (Non-Calc):	14	[2m]
Q2 (Non-Calc):	$\frac{3}{10}$	[2m]
Q3 (Non-Calc):	7	[2m]
Q4 (Non-Calc):	41	[2m]
Q5 (Non-Calc):	2	[3m]
Q6 (Non-Calc):	$\frac{13}{50}$ (see Venn diagram below)	[3m]

Q1 — Completed Venn Diagram**Q2 — Completed Venn Diagram****Q3 — Completed Venn Diagram****Q4 — Completed Venn Diagram**

Q5 — Completed Venn Diagram



Q6 — Completed Venn Diagram



Topic 28: Probability Trees

Q1 (Non-Calc):

0.28 (see probability tree below) [3m]

Q2 (Non-Calc):

0.14 [2m]

Q3 (Non-Calc):

0.46 (see probability tree below) [3m]

Q4 (Non-Calc):

(a) 0.7, 0.6, 0.3 (see tree below) | (b) 0.67 [3m]

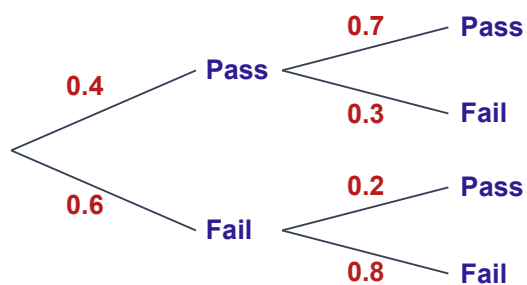
Q5 (Non-Calc):

(a) 0.8, 0.9, 0.8 (see tree below) | (b) 0.36 [3m]

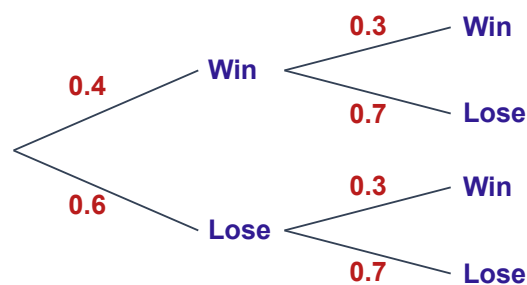
Q6 (Non-Calc):

0.94 [2m]

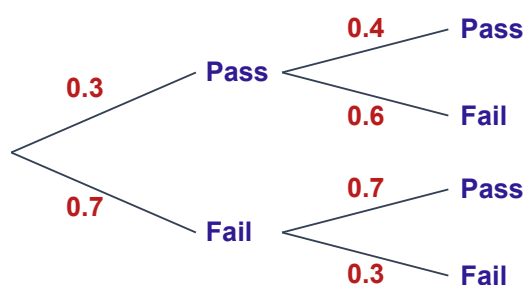
Q1 — Completed Probability Tree



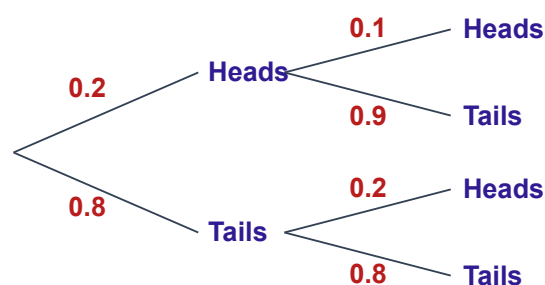
Q3 — Completed Probability Tree



Q4 — Completed Probability Tree



Q5 — Completed Probability Tree



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

Q1 (Standard Form Calculating, Non-Calc):

$$5 \times 10^7 \quad [2m]$$

Q3 (Changing the Subject, Non-Calc):

$$t = \frac{5v + 8}{3} \quad [3m]$$

Q5 (Combining Ratios, Non-Calc):

$$8 : 12 : 15 \quad [3m]$$

Q7 (Inverse Proportion, Non-Calc):

$$4 \text{ days } (48 \div 12) \quad [3m]$$

Q9 (Linear Simultaneous Equations, Non-Calc):

$$x = 5, y = 2 \quad [3m]$$

Q11 (Venn Diagrams, Non-Calc):

(a) 24, 10, 18, out 8;
(b) $\frac{2}{5} \left(\frac{24}{60} \right)$ [4m]

Q13 (Vectors, Non-Calc):

$$2\mathbf{a} + 3\mathbf{b} \quad \overrightarrow{MA} = 4\mathbf{a}, \quad \overrightarrow{AN} = -2\mathbf{a} + 3\mathbf{b} \quad [3m]$$

Q15 (Probability Trees, Non-Calc):

$$0.51 (1 - 0.7 \times 0.7) \quad [3m]$$

Q2 (Reverse Percentages, Non-Calc):

$$\pounds 170 (136 \div 0.8) \quad [3m]$$

Q4 (Solving Quadratics, Non-Calc):

(a) $(x - 8)(x + 3)$,
(b) $x = 8, -3$ [3m]

Q6 (Equation of a Line, Non-Calc):

$$y = 3x + 11 \quad [3m]$$

Q8 (Trigonometry Exact Values, Non-Calc):

$$9\sqrt{3} \text{ cm } (18 \times \frac{\sqrt{3}}{2}) \quad [3m]$$

Q10 (Sector Perimeter, Non-Calc):

$$6\pi + 18 \text{ cm} \quad [3m]$$

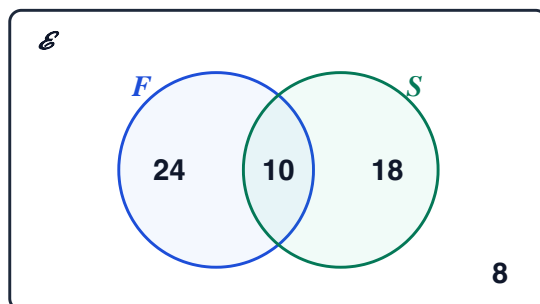
Q12 (Spheres & Cones Surface Area, Non-Calc):

$$96\pi \text{ cm}^2 (l = 10; \pi(6)(10) + \pi(6^2)) \quad [3m]$$

Q14 (Density, Mass, Volume, Non-Calc):

$$8.5 \text{ g/cm}^3 (1,700 \div 200) \quad [3m]$$

Q11 — Completed Solution Diagram



Mixed Review 2 — Choosing the Right Method (Calculator) — Answers & Topic Guide

Q1 (Standard Form Calculating, Calc):

$$6.98 \times 10^5 \quad [2m]$$

Q3 (Speed, Distance, Time, Calc):

$$89.1 \text{ km/h } (245 \div 2.75) \quad [3m]$$

Q5 (Ratios & Percentages, Calc):

$$\left(\frac{7 \times 20 + 5 \times 35}{12} \right) = 26.25\% \quad [3m]$$

Q2 (Reverse Percentages, Calc):

$$\pounds 1,350 (1,512 \div 1.12) \quad [3m]$$

Q4 (SOHCAHTOA Angles, Calc):

$$32.9^\circ (\tan^{-1}(11/17)) \quad [3m]$$

Q6 (Linear Direct Proportion, Calc):

$$14 (y = 4.5x) \quad [3m]$$

Q7 (Sector Area, Calc):

$$45.4 \text{ cm}^2$$

$$\left(\frac{72}{360} \times \pi \times 8.5^2\right)$$

[3m]

Q8 (Worded Simultaneous Equations, Calc):

$$\text{Adult} = \text{£}30, \text{ Child} = \text{£}13$$

[4m]

Q9 (Density of Mixtures, Calc):

$$0.98 \text{ g/cm}^3$$

$$((180 + 212.5) \div 400)$$

[3m]

Q10 (Hemisphere Surface Area, Calc):

$$461.8 \text{ cm}^2$$

$$(3\pi \times 7^2 = 147\pi)$$

[3m]

Q11 (Solving Equations Graphically, Calc):

$$(3, 7)$$

$$(4x - 5 = 13 - 2x, x = 3)$$

[3m]

Q12 (Enlargements, Calc):

$$(0, 1), (4, 1), (0, 7)$$

[3m]

Q13 (Pressure, Force, Area, Calc):

$$19,100 \text{ N/m}^2$$

$$(9,600 \div (\pi \times 0.4^2))$$

[3m]

Q14 (Probability Trees, Calc):

$$0.19 (0.25 \times 0.4 + 0.75 \times 0.12)$$

[3m]

Q15 (Multi-Step Pythagoras & Trig, Calc):

$$24.4 \text{ cm}$$

$$(BD = 15 \text{ cm}; 15 \div \sin 38^\circ)$$

[3m]

Q12 — Completed Solution Diagram