

Please check the examination details below before entering your candidate information

Candidate surname		Other names	
Centre Number		Candidate Number	

Pearson Edexcel Level 1/Level 2 GCSE (9–1)

Wednesday 4 June 2025

Morning (Time: 1 hour 30 minutes)	Paper reference	1MA1/2H
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Mathematics

PAPER 2 (Calculator)

Higher Tier



You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB or B pencil, eraser, calculator, Formulae Sheet (enclosed). Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end

Turn over ►

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.CG Maths.
Worked Solutions


Pearson

Please note that these worked solutions have neither been provided nor approved by Pearson Education and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue should be written in the exam.

Anything written in green in a rectangle doesn't have to be written in the exam.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 (a) Express 250 as a product of its prime factors.

The calculator can do this

$$\frac{2 \times 5^3}{(2)}$$

- (b) Find the lowest common multiple (LCM) of 30 and 25

$$2 \times 3 \times 5 \leftarrow \text{Expressing 30 as a product of its prime factors}$$

$$5^2 \leftarrow \text{Expressing 25 as a product of its prime factors}$$

$$2 \times 3 \times 5^2 \leftarrow \text{The LCM is the highest power of each prime in both lists multiplied together}$$

Alternatively, newer Casio calculators can find the LCM without having to do this method

$$\frac{150}{(2)}$$

(Total for Question 1 is 4 marks)

2 Sid, Tam and Musa share £6900 in the ratio 2:3:5

Work out how much money each person receives.

$$2 + 3 + 5$$

Adding the number of parts in the ratio for each person finds that there are 10 parts in total in the ratio

$$6900 \div 10$$

Dividing the total £6900 by the 10 parts finds that 1 part of the ratio is worth £690

$$690 \times 2$$

Multiplying the value of 1 part of the ratio by 2 finds that the 2 parts represent £1380

$$690 \times 3$$

Multiplying the value of 1 part of the ratio by 3 finds that the 3 parts represent £2070

$$690 \times 5$$

Multiplying the value of 1 part of the ratio by 5 finds that the 5 parts represent £3450

Sid £.....1380

Tam £.....2070

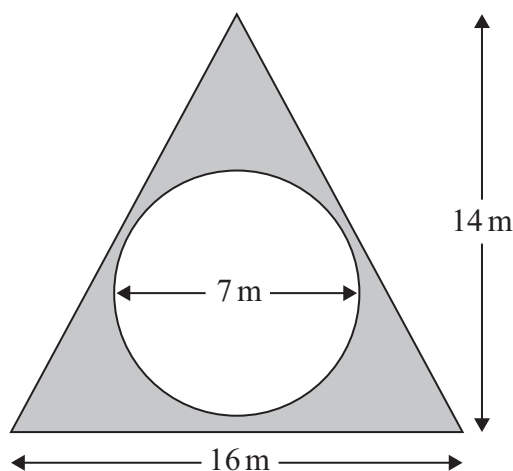
Musa £.....3450

(Total for Question 2 is 3 marks)

3 Here is a plan of part of Macsen's garden.

There is a circle inside a triangle.

The circle has a diameter of 7 m.



Macsen will cover the shaded area with gravel.

Gravel is sold in bags.

Each bag of gravel covers an area of 12.5 m^2

(a) Work out the number of bags of gravel Macsen will need.

$$\frac{1}{2} \times 16 \times 14 = 112 \quad \leftarrow \text{Area of triangle} = \frac{1}{2} \times \text{base} \times \text{height. So the area of the triangle is } 112 \text{ m}^2$$

$$7 \div 2 \quad \leftarrow \text{Radius is half the diameter. So dividing the diameter by 2 finds that the radius is } 3.5 \text{ m}$$

$$\pi \times 3.5^2 \quad \leftarrow \text{Area of circle} = \pi \times \text{radius}^2. \text{ So the area of the circle is } 38.4... \text{ m}^2$$

$$112 - 38.4... \quad \leftarrow \text{Subtracting the area of the circle from the area of the triangle finds that the shaded area to be covered with gravel is } 73.5... \text{ m}^2$$

$$73.5... \div 12.5 \quad \leftarrow \text{Dividing the area to be covered with gravel by the } 12.5 \text{ m}^2 \text{ each bag covers finds that } 5.8... \text{ bags are needed}$$

5.8... must be rounded up to 6 as rounding down to 5 would not be enough bags

6

bags

(4)

Macsen finds that each bag of gravel only covers an area of 11 m^2

(b) How does this affect your answer to part (a)?

$$73.5 \dots \div 11 = 6.6 \dots$$

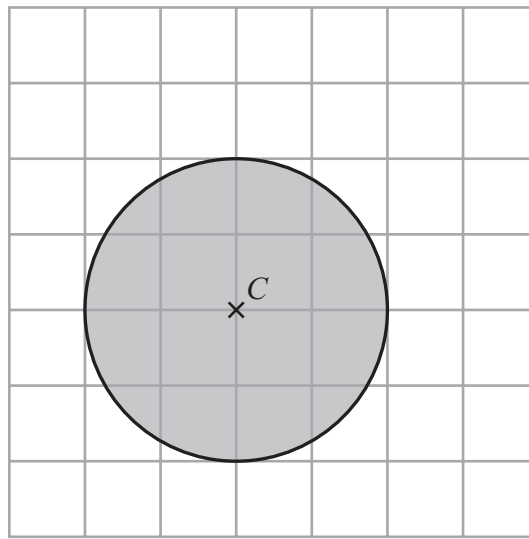
It will increase

Dividing the area to be covered with gravel by the 11 m^2 gives more than 6 bags

(1)

(Total for Question 3 is 5 marks)

4 The point C is shown on a centimetre grid.



A point P is at least 2 cm from the point C .

Nadia is asked to shade the region where point P could be.

Her answer is shown on the grid.

Explain the mistake Nadia has made.

Should have shaded outside of the circle

The circle is correct as all points on the circumference of the circle are 2 cm away from C . However shading inside the circle gives all the points 2 cm or less away from C , not at least 2 cm from C

(Total for Question 4 is 1 mark)

- 5 This year the total weight of potatoes grown on a farm is $\frac{1}{5}$ less than last year.

This year the total weight of potatoes grown is 8000 tonnes.

Work out the total weight of potatoes grown last year.

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

There was 1 lot of potatoes grown last year. Subtracting the $\frac{1}{5}$ finds that this year is $\frac{4}{5}$ of last year

$$8000 \div 4$$

Dividing the 8000 tonnes by 4 takes it from $\frac{4}{5}$ to $\frac{1}{5}$ of the potatoes last year

$$2000 \times 5$$

Multiplying the value of $\frac{1}{5}$ of last year's potatoes by 5 finds the whole of the potatoes last year

.....10000..... tonnes

(Total for Question 5 is 3 marks)

6 Here are two lists of numbers.

List A 276 400 157 139

List B 530 500 270 x 440 320

mean of list A : mean of list B = 3 : 5

Work out the value of x .

$\begin{array}{c} t \\ m \quad n \end{array}$

Writing a formula triangle for mean, total, number. Total is all of the numbers added together and number is the number of numbers

$$276 + 400 + 157 + 139$$

Adding all the numbers in list A finds that their total is 972

$$972 \div 4$$

Covering m in the formula triangle finds that mean = total $\div$ number. So dividing the total of list A by the 4 numbers finds that the mean of list A is 243

$$243 \div 3$$

3 parts of the ratio represent the mean of list A. So dividing the mean of list A by 3 finds that 1 part of the ratio is worth 81

$$81 \times 5$$

Multiplying the value of 1 part of the ratio by the 5 parts representing the mean of list B finds that the mean of list B is 405

$$405 \times 6$$

Covering t in the formula triangle finds that total = mean $\times$ number. So multiplying the mean of list B by the 6 numbers in list B finds that the total of list B is 2430

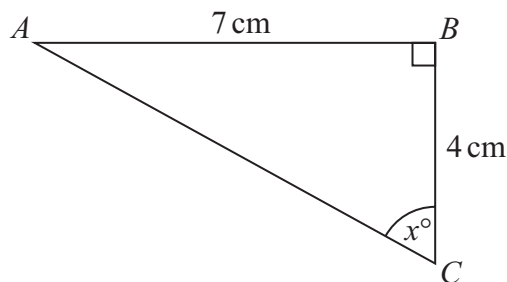
$$2430 - 530 - 500 - 270 - 440 - 320$$

Subtracting the known numbers from the total of list B finds that x is 370

$$x = \dots\dots\dots 370$$

(Total for Question 6 is 5 marks)

7 ABC is a right-angled triangle.



Calculate the value of x .

Give your answer correct to 1 decimal place.

SOHCAHTOA

Using right-angled trigonometry. Ticking O as the 7 cm is the opposite. Ticking A as the 4 cm is the adjacent. There are two ticks on the TOA formula triangle so this one can be used

$$\tan x = \frac{7}{4}$$

Covering t finds that $\tan$ of the angle = opposite/adjacent

$$x = \tan^{-1}\left(\frac{7}{4}\right)$$

Doing the inverse $\tan$ of both sides finds x

$$x = 60.3$$

(Total for Question 7 is 2 marks)

8 Metal rods are made from steel with density 8 g/cm^3
Each metal rod has a volume of 1500 cm^3

The maximum mass of metal rods that can be put on a trolley is 300 kg.

Work out the greatest number of metal rods that can be put on the trolley.

d^m_v

Writing a formula triangle for density, mass, volume

$$8 \times 1500$$

Covering m in the formula triangle finds that $\text{mass} = \text{density} \times \text{volume}$. So the mass of each metal rod is 12000 g, as g was involved in the unit of density

$$12000 \div 1000$$

1 kg = 1000 g. So dividing the 12000 g by 1000 converts it to 12 kg

$$300 \div 12$$

Dividing the 300 kg by the 12 kg mass of each metal rod finds that 25 metal rods can be put on the trolley

$$25$$

(Total for Question 8 is 3 marks)

9 $3x^{-1}(4x - x^3) = a + bx^n$ for all the values of x that are not zero.

Find the value of a , the value of b and the value of n .

Expanding the bracket on the left side.

$12 - 3x^2 \leftarrow 3x^{-1} \times 4x = 12$, as $3 \times 4 = 12$ and $x^{-1} \times x^1 = x^{-1+1} = x^0 = 1$ then $12 \times 1 = 12$.

$3x^{-1} \times -x^3 = 3x^2$, as $x^{-1} \times x^3 = x^{-1+3} = x^2$

The left side is now in the same form as the right side. $12 - 3x^2 = a + bx^n$.
Each letter can be equated to the number on the left.

$a = 12$

$b = -3$

$n = 2$

(Total for Question 9 is 2 marks)

10 Solve $\frac{14 - x}{3} = 3x$

$14 - x = 9x \leftarrow$ Multiplying both sides by 3 eliminates the 3 as the denominator on the left

$14 = 10x \leftarrow$ Adding x to both sides eliminates the $-x$ on the left and gets all the x on the same side

Dividing both sides by 10 eliminates the 10 on the right and gets x on its own. $1.4 = x$ so $x = 1.4$

$x = 1.4$

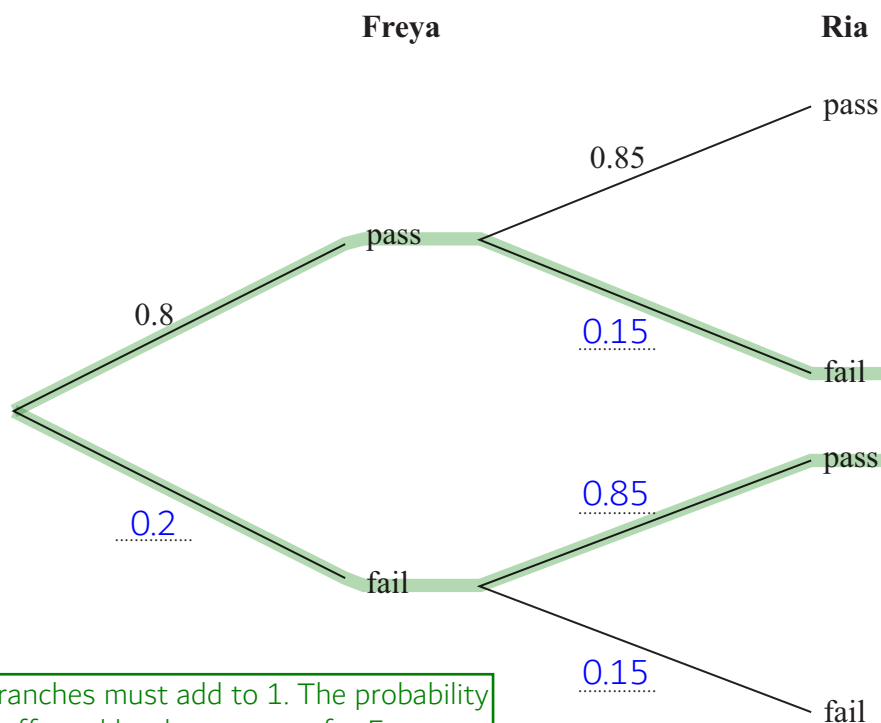
(Total for Question 10 is 2 marks)

11 Freya and Ria each do an exam.

The probability that Freya will pass the exam is 0.8

The probability that Ria will pass the exam is 0.85

(a) Complete the probability tree diagram.



Each set of branches must add to 1. The probability for Ria is not effected by the outcome for Freya

(2)

(b) Work out the probability that only one of Freya or Ria will pass the exam.

$$0.8 \times 0.15 + 0.2 \times 0.85$$

Pass AND fail OR fail AND pass. The routes are highlighted in green on the tree diagram. AND means to multiply the probabilities. OR means to add the probabilities

0.29

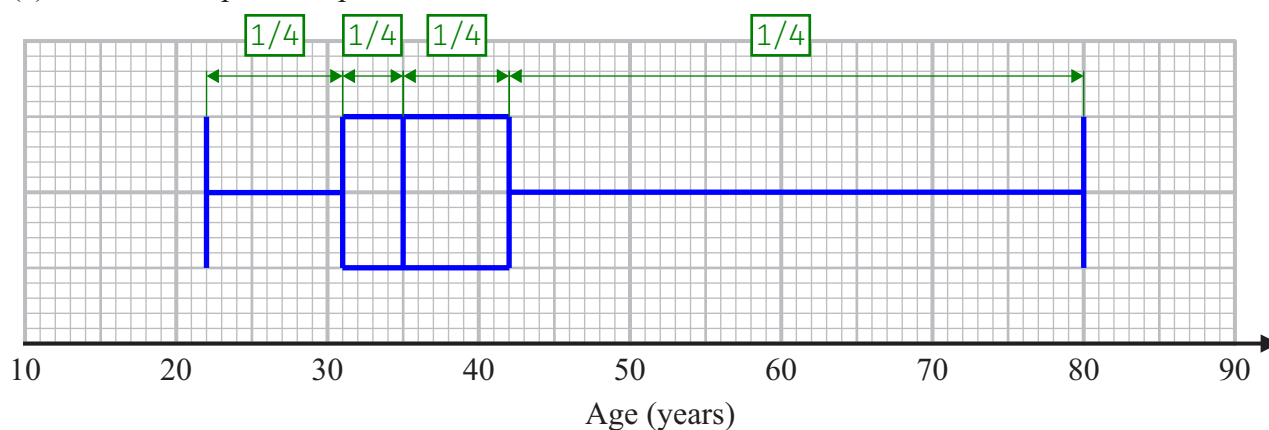
(3)

(Total for Question 11 is 5 marks)

12 The table gives some information about the ages, in years, of 32 actors.

Lowest age	21
Highest age	80
Lower quartile	31
Upper quartile	42
Median	35

(a) Draw a box plot to represent this information.



Drawing vertical lines for the lowest, lower quartile, median, upper quartile and highest. Then joining up into a box plot

(3)

(b) Work out an estimate for the number of these actors with an age between 31 years and 42 years.

$$\frac{2}{4} \times 32$$

The box plot splits the data into quarters. 2 of the quarters are between 31 years and 42 years. So doing $\frac{2}{4}$ of the 32 actors

16

(1)

Mary says,

“At least one of the actors is 35 years old because the median is 35”

(c) Is Mary correct?

Give a reason for your answer.

No, the median could be halfway between two different ages

Using the formula $(n + 1)/2$, $(32 + 1)/2 = 16.5$. So the median is halfway between the 16th and 17th actor when put in order. The 16th could be 34 years old and the 17th could be 36 years old. So there could be no actors with age 35 years

(1)

(Total for Question 12 is 5 marks)

13 Show that $(2x + 3)(x - 1)(x + 2)$ can be written in the form

$ax^3 + bx^2 + cx + d$ where a, b, c and d are integers.

$2x^2 - 2x + 3x - 3$ ← Expanding the first two brackets

$(2x^2 + x - 3)(x + 2)$ ← Collecting like terms and writing multiplied by the third bracket

$2x^3 + 4x^2 + x^2 + 2x - 3x - 6$ ← Expanding

$2x^3 + 5x^2 - x - 6$ ← Collecting like terms

(Total for Question 13 is 3 marks)

14 There are 15 dogs in a dog show.

One dog is awarded first prize. ← 1st event

A different dog is awarded second prize. ← 2nd event

There are 12 cats in a cat show. ← 3rd event

One cat is awarded first prize. ← 4th event

A different cat is awarded second prize.

Work out how many different ways these four prizes can be awarded.

$$15 \times 14 \times 12 \times 11$$

Using the product rule for counting. Multiplying the number of possible outcomes for each event finds the total number of possible outcomes. There are 15 dogs for the 1st event. There are 14 dogs for the 2nd event as 1 dog is already chosen. There are 12 cats for the 3rd event. There are 11 cats for the 4th event as 1 cat is already chosen

27720

(Total for Question 14 is 3 marks)

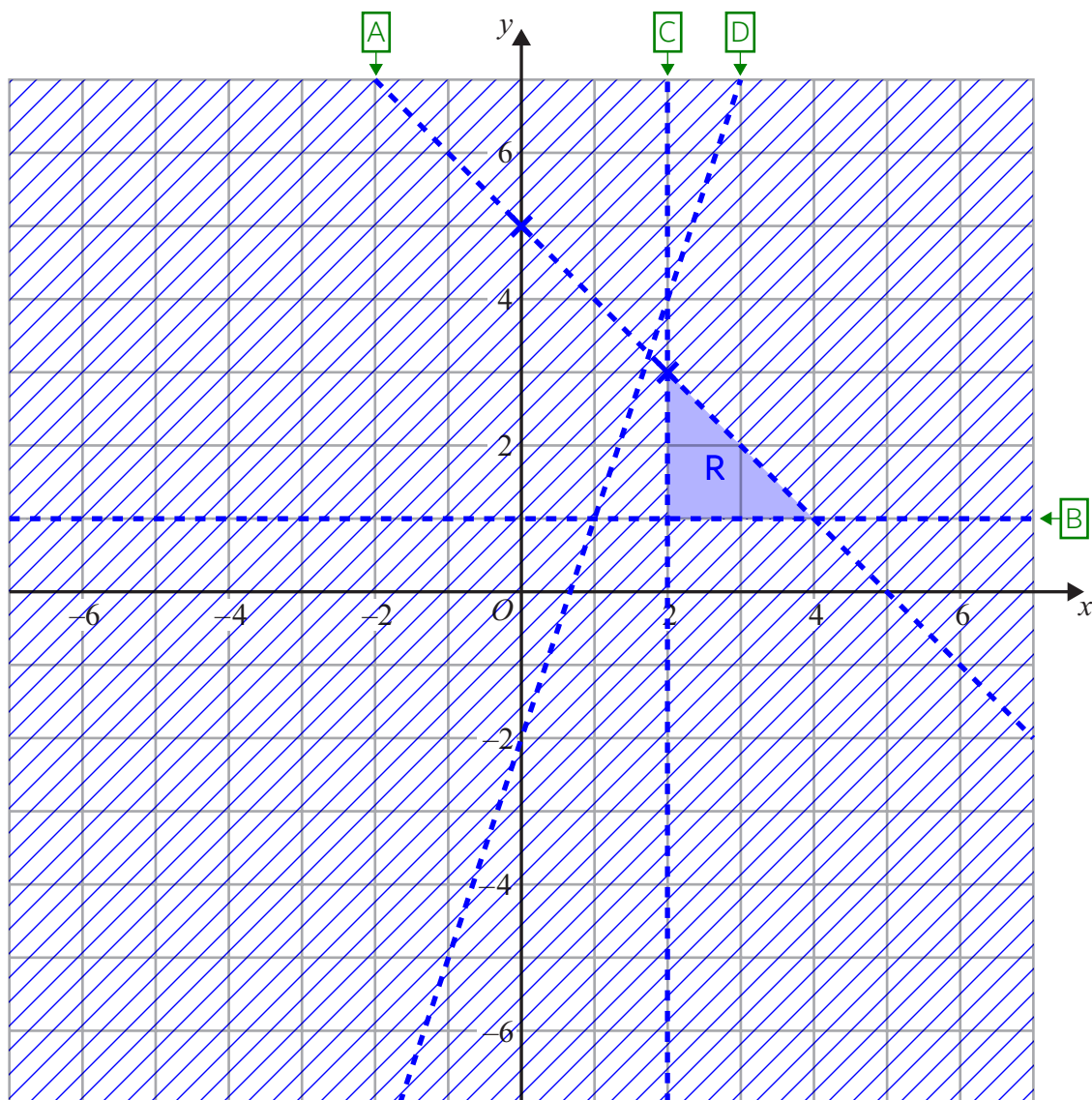
15 (a) On the grid, show by shading, the region that satisfies all of these inequalities.

$$x + y < 5 \quad y > 1 \quad x > 2 \quad y < 3x - 2$$

Label the region **R**.

$$y < 5 - x$$

Subtracting x from both sides to make y the subject makes the inequality easier to draw



See next page for explanation

(4)

Ron says,

“I can remove one of the four inequalities from the grid so that the region **R** will not change.”

Ron is correct.

(b) Which inequality can be removed so that the region **R** will not change?

As the line for this inequality does not form a boundary for the region, removing it makes no difference

$$y < 3x - 2$$

(1)

(Total for Question 15 is 5 marks)

A: drawing the line $y = 5 - x$. When $x = 0$, $y = 5 - 0 = 5$, so plotting the point $(0, 5)$. When $x = 2$, $y = 5 - 2 = 3$, so plotting the point $(2, 3)$. It is a straight line so using a ruler to draw through both of these points. The line is dashed as y cannot be equal to. Crossing out everything above the line as y is less.

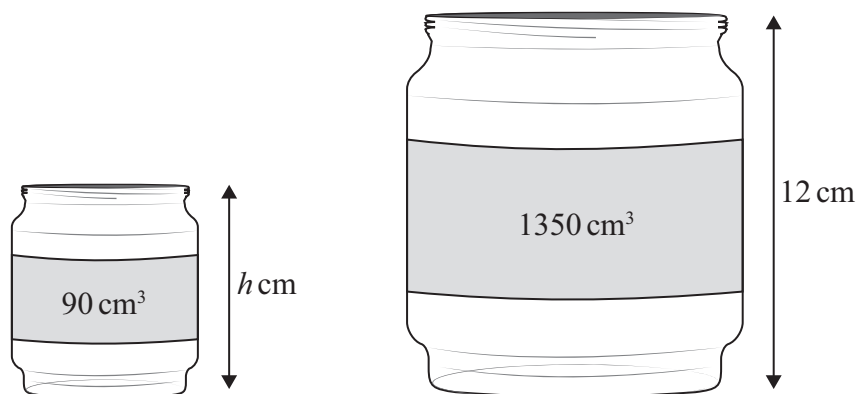
B: drawing the line $y = 1$. All the y -coordinates on this line are 1. The line is dashed as y cannot be equal to. Crossing out everything below the line as y is greater.

C: drawing the line $x = 2$. All the x -coordinates on this line are 2. The line is dashed as x cannot be equal to. Crossing out everything to the left of the line as x is greater.

D: drawing the line $y = 3x - 2$. It is in the form $y = mx + c$, where m is the gradient and c is the y -intercept. So the y -intercept is -2 and it has a gradient of 3, meaning every 1 it goes to the right it goes up 3. Dashing the line as y cannot be equal to. Crossing out everything above the line as y is less.

The region is where it is not crossed out

16 Two jars are mathematically similar.



- (a) Work out the height, h cm, of the smaller jar.
Give your answer correct to 1 decimal place.

$$1350 \div 90$$

Dividing the volume of the larger jar by the volume of the smaller jar finds that the volume scale factor is 15 from the smaller jar to the larger jar

$$12 \div \sqrt[3]{15}$$

The unit of volume is cm^3 and the unit of length is cm. So cube rooting the volume scale factor gives the length scale factor. Dividing the height of the larger jar by this finds the height of the smaller jar

4.86... cm is rounded correct to 1 decimal place

4.9 cm
(4)

The surface area of the smaller jar is $A \text{ cm}^2$
The surface area of the larger jar is $pA \text{ cm}^2$

- (b) Find the exact value of p .

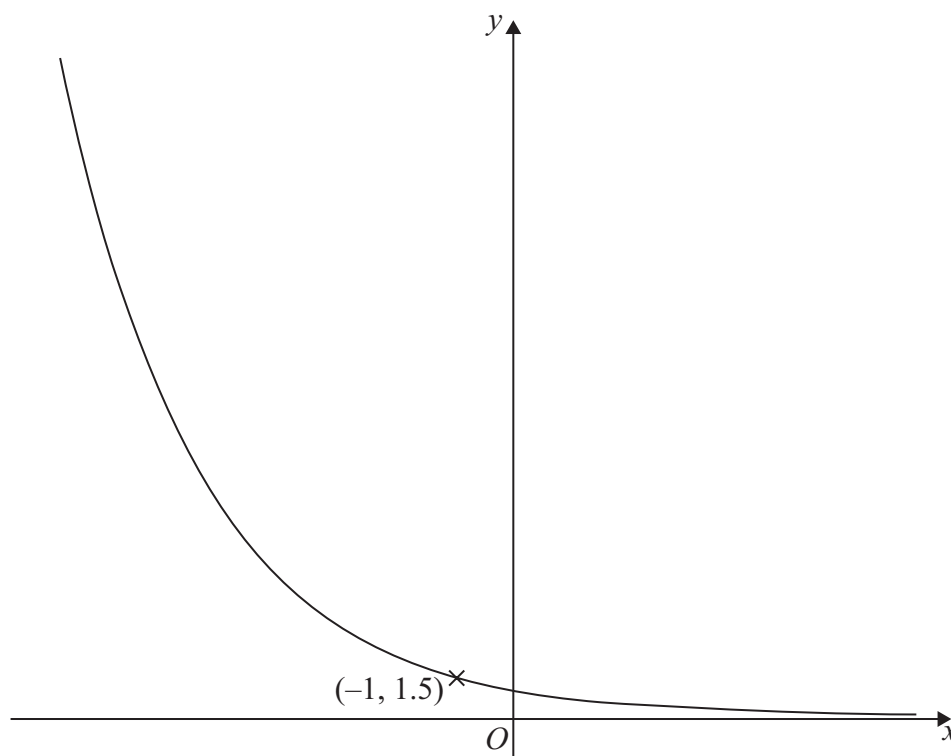
The length scale factor was $\sqrt[3]{15}$. The unit of length is cm and the unit of area is cm^2 . So squaring the length scale factor gives the area scale factor. This is p , which is what the surface area of the smaller jar is multiplied by to get the surface area of the larger jar

This cannot be given as a decimal as it is an irrational number, which goes on forever with more decimal places. The decimal given by the calculator is not exact

$p = \sqrt[3]{15}^2$
(1)

(Total for Question 16 is 5 marks)

17 Here is a sketch of part of the graph of $y = k^x$ where k is a positive constant.



The graph passes through the point with coordinates $(-1, 1.5)$

Find the value of k .

$$1.5 = k^{-1}$$

The point with coordinates $(-1, 1.5)$ must satisfy the equation.
So substituting the x and y -coordinate into the equation

$$\sqrt[-1]{1.5} = k$$

Doing the -1 th root of both sides gets k on its own

$$k = \frac{2}{3}$$

(Total for Question 17 is 2 marks)

- 18 At the start of year n , the population of deer in a park is D_n
At the start of the following year, the population of the deer is D_{n+1}

$$D_{n+1} = K D_n \quad \text{where } K \text{ is a constant.}$$

At the start of 2019, the population of the deer was 2000

At the start of 2020, the population of the deer was 2400

Show that, at the start of 2022, the population of the deer was greater than 3000

$$2400 = K \times 2000$$

Substituting the population in 2020 for D_{n+1} and substituting the population in 2019 for D_n , as D_n is the population in the current year and D_{n+1} is the population in the next year

$$K = 1.2$$

Dividing both sides by 2000 gets k on its own and finds that k is 1.2

$$D_{2021} = 1.2 \times 2400$$

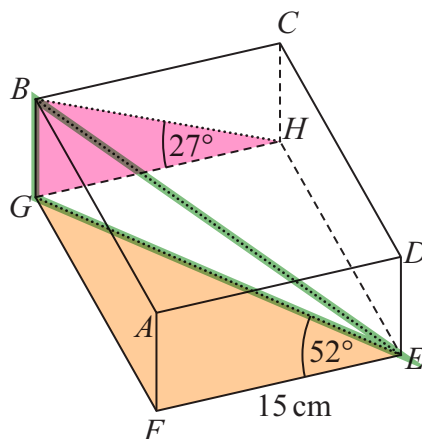
Substituting the population in 2020 for D_n finds that the population in 2021 was 2880

$$D_{2022} = 1.2 \times 2880 = 3456$$

Substituting the population in 2021 for D_n finds that the population in 2022 was 3456, which is greater than 3000

(Total for Question 18 is 3 marks)

19 $ABCDEFGH$ is a cuboid.



Angle $GEF = 52^\circ$

Angle $BHG = 27^\circ$

$EF = 15$ cm

Work out the size of angle GEB .

Give your answer to the nearest degree.

$\begin{matrix} \text{O} & \text{H} & \text{C} & \text{A} & \text{T} & \text{O} \\ \text{S} & \text{H} & \text{C} & \text{H} & \text{T} & \text{A} \end{matrix}$

Using right-angled trigonometry in the orange right-angled triangle. Ticking A as FE is the adjacent and ticking H as GE is useful to find and this is the hypotenuse. There are two ticks on the CAH formula triangle so this one can be used

$$15 \div \cos 52 = 24.3... \text{ (A)}$$

Covering H in the formula triangle finds that hypotenuse = adjacent $\div$ cos of the angle. Storing the exact answer as A on the calculator

$\begin{matrix} \text{O} & \text{H} & \text{C} & \text{A} & \text{T} & \text{O} \\ \text{S} & \text{H} & \text{C} & \text{H} & \text{T} & \text{A} \end{matrix}$

Using right-angled trigonometry in the pink right-angled triangle. Ticking A as GH is the adjacent (which is 15 cm as it is the same side length as FE) and ticking O as GB is useful to find and this is the opposite. There are two ticks on the TOA formula triangle so this one can be used

$$\tan 27 \times 15 = 7.6... \text{ (B)}$$

Covering O in the formula triangle finds that opposite = tan of the angle $\times$ adjacent. Storing the exact answer as B on the calculator

$\begin{matrix} \text{O} & \text{H} & \text{C} & \text{A} & \text{T} & \text{O} \\ \text{S} & \text{H} & \text{C} & \text{H} & \text{T} & \text{A} \end{matrix}$

Using right-angled trigonometry in the green right-angled triangle. Ticking O as GB is the opposite and ticking A as GE is the adjacent. There are two ticks on the TOA formula triangle so this one can be used

$$\tan x = 7.6... \div 24.3...$$

Covering T in the formula triangle finds that tan of the angle = opposite $\div$ adjacent. Using the exact stored values of A and B. x is the angle GEB

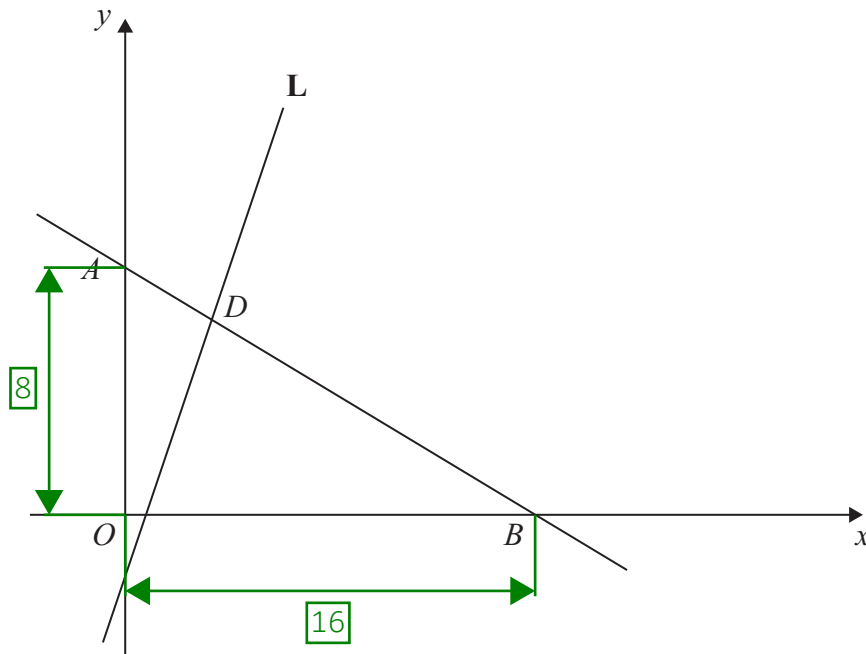
$$x = \tan^{-1}(0.3...)$$

Doing the inverse tan of both sides gets angle x on its own

17.4... is rounded to the nearest degree

17

(Total for Question 19 is 4 marks)



In the diagram

A is the point $(0, 8)$

B is the point $(16, 0)$

The point D divides the line segment AB in the ratio $1:3$

The line L passes through D .

The gradient of L is $\sqrt{3}$

L passes through the point with coordinates $(-2, f)$

Show that $f < -4$

$$16 \div 4 = 4 \quad \leftarrow \quad \begin{array}{l} 1 + 3 = 4 \text{ parts in total in the ratio. So dividing the distance of 16 in the x-direction from} \\ A \text{ to } B \text{ by 4 finds that } AD \text{ is 4 in the x-direction. So } D \text{ must have an x-coordinate of 4} \end{array}$$

$$8 \div 4 \quad \leftarrow \quad \begin{array}{l} 1 + 3 = 4 \text{ parts in total in the ratio. So dividing the distance of 8 in} \\ \text{the y-direction from } A \text{ to } B \text{ by 4 finds that } AD \text{ is 2 in the y-direction} \end{array}$$

$$8 - 2 = 6 \quad \leftarrow \quad \begin{array}{l} \text{Subtracting } AD \text{ in the y-direction from the} \\ \text{y-coordinate of } A \text{ finds that the y-coordinate of } D \text{ is 6} \end{array}$$

$$6 = \sqrt{3} \times 4 + c \quad \leftarrow \quad \begin{array}{l} \text{The general equation of a straight line is } y = mx + c, \text{ where } m \text{ is} \\ \text{the gradient and } c \text{ is the y-intercept. Substituting the} \\ \text{y-coordinate of } D \text{ for } y, \sqrt{3} \text{ for } m \text{ and the x-coordinate of } D \text{ for } x \end{array}$$

$$c = 6 - 4\sqrt{3} \quad \leftarrow \quad \begin{array}{l} \text{Subtracting the } \sqrt{3} \times 4 \text{ from both sides gets } c \text{ on its own and finds its value} \end{array}$$

$$f = \sqrt{3} \times -2 + 6 - 4\sqrt{3} \quad \leftarrow \quad \begin{array}{l} \text{The general equation of a straight line is } y = mx + c, \text{ where } m \text{ is the gradient and} \\ c \text{ is the y-intercept. Substituting } f \text{ for } y \text{ (as } f \text{ is the y-coordinate of the point),} \\ \sqrt{3} \text{ for } m, -2 \text{ for } x \text{ (as this is the x-coordinate of the point) and the value of } c \end{array}$$

$$= -4.3... \quad \leftarrow \quad \begin{array}{l} \text{Using the calculator to give a decimal shows that } f \text{ is less than } -4 \end{array}$$

(Total for Question 20 is 5 marks)

21 Solve $(3x - 1)(5x + 2) < 0$ ← First considering when it is equal to 0 rather than less than 0

$$3x - 1 = 0$$

← One of the two brackets must equal 0 in order to multiply to 0. Setting the first bracket equal to 0

$$3x = 1$$

← Adding 1 to both sides gets the x term on its own

$$x = \frac{1}{3}$$

← Dividing both sides by 3 gets x on its own

$$5x + 2 = 0$$

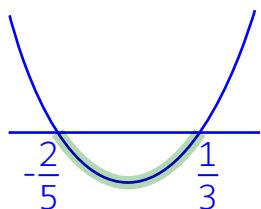
← One of the two brackets must equal 0 in order to multiply to 0. Setting the second bracket equal to 0

$$5x = -2$$

← Subtracting 2 from both sides gets the x term on its own

$$x = -\frac{2}{5}$$

← Dividing both sides by 5 gets x on its own



← Sketching a graph. The two roots where it is equal to 0 in the y-direction are $-2/5$ and $1/3$. The graph must be U-shaped as when expanding the bracket it will be positive x^2

It is less than 0 in the y-direction when x is between $-2/5$ and $1/3$ → $-\frac{2}{5} < x < \frac{1}{3}$

(Total for Question 21 is 2 marks)

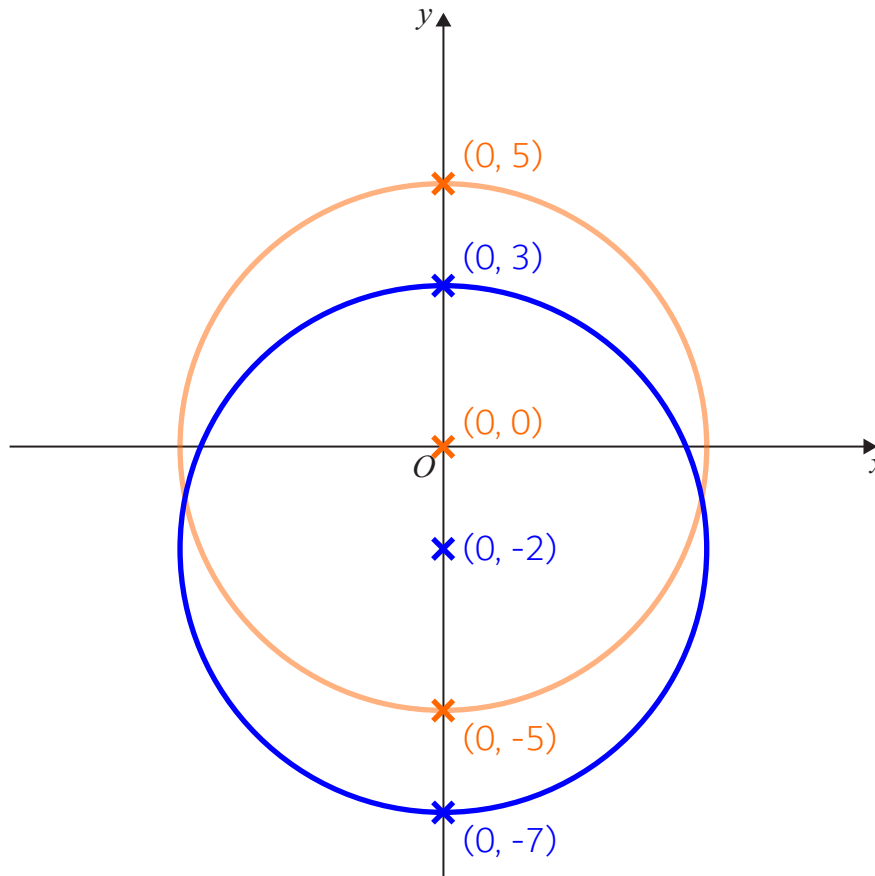
22 The equation of circle **A** is $x^2 + y^2 = 25$

Circle **A** is translated by the vector $\begin{pmatrix} 0 \\ -2 \end{pmatrix}$ to give circle **B**.

Sketch circle **B**.

Show the coordinates of

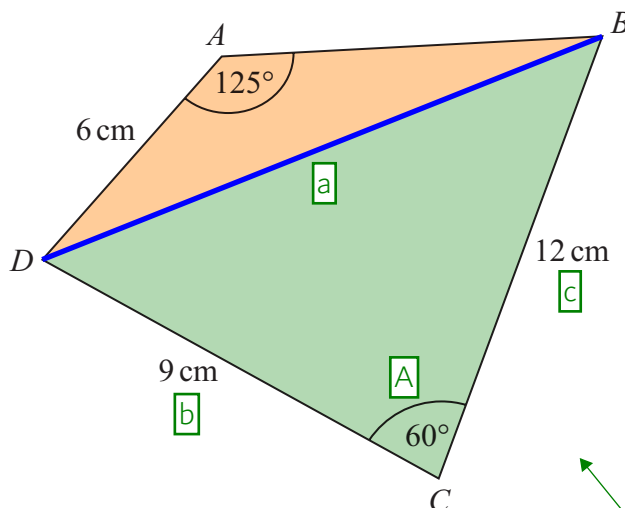
the centre of circle **B**
and the points where circle **B** meets the y -axis.



(Total for Question 22 is 3 marks)

The general equation of a circle with its centre at the origin is $x^2 + y^2 = \text{radius}^2$. So the radius is 5 (as $5^2 = 25$) and the centre was at $(0, 0)$, as shown in orange. Translating it 2 down gives the circle drawn in blue

23 $ABCD$ is a quadrilateral.



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

Find the size of angle ABC .

Give your answer correct to the nearest degree.

Drawing a line from D to B splits the quadrilateral into two triangles without splitting the known angles

$$DB^2 = 9^2 + 12^2 - 2 \times 9 \times 12 \times \cos 60$$

Using the cosine rule in the green triangle to find DB . $a^2 = b^2 + c^2 - 2bccosA$

$$DB = \sqrt{117}$$

Square rooting both sides finds DB

$$\frac{\sin DBC}{9} = \frac{\sin 60}{\sqrt{117}}$$

$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

Using the sine rule in the green triangle to find angle DBC . Side a is opposite angle A and side b is opposite angle B

$$\sin DBC = 0.72...$$

Multiplying both sides by 9 to eliminate the denominator on the left

$$DBC = 46.1... \text{ (A)}$$

Doing the inverse sin of both sides finds angle DBC . Storing the exact answer as A on the calculator

$$\frac{\sin DBA}{6} = \frac{\sin 125}{\sqrt{117}}$$

$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

Using the sine rule in the orange triangle to find angle DBA . Side a is opposite angle A and side b is opposite angle B

$$\sin DBA = 0.45...$$

Multiplying both sides by 6 to eliminate the denominator on the left

$$DBA = 27.0... \text{ (B)}$$

Doing the inverse sin of both sides finds angle DBA . Storing the exact answer as B on the calculator

$$46.1... + 27.0...$$

Adding angle DBC and angle DBA gives angle ABC . Using the exact values stored on the calculator

73.1... is rounded to the nearest degree

73

(Total for Question 23 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS