Please check the examination details below before entering your candidate information

Candidate surname [redacted] Ot[redacted]

Centre Number [redacted] Candidate Number

ND095929634

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

Wednesday 4 June 2025

Morning (Time: 1 hour 30 minutes)

Paper reference **1MA1/2H**

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 53

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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Y:\/\/\/\/\/

P 7 6 4 0 5 A 0 1 2 4

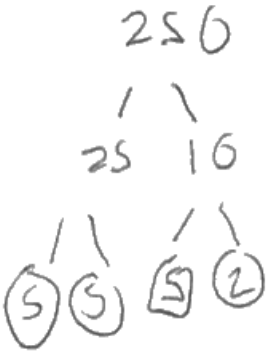
Pearson

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.

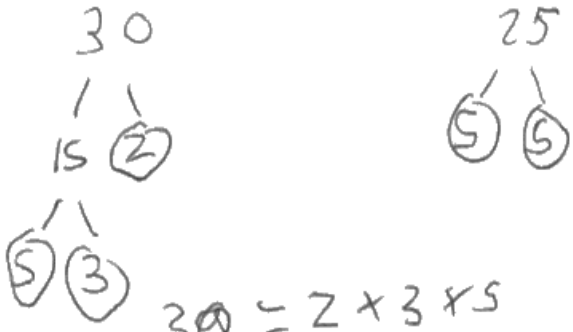


$250 = 2 \times 5^3$

2×5^3

(2) 2 Q01a

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



$30 = 2 \times 3 \times 5$

$25 = 5^2$

$LCM = 2 \times 3 \times 5^2 = 150$

150

(2) 2 Q01b

(Total for Question 1 is 4 marks) **4**

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

3 Q02

Work out how much money each person receives.

1 part: $2+3+5=10$

$\frac{6900}{10} = £690$

Sid: $690 \times 2 = £1380$

Tam: $690 \times 3 = £2070$

Musa: $690 \times 5 = £3450$

Sid £ 1380

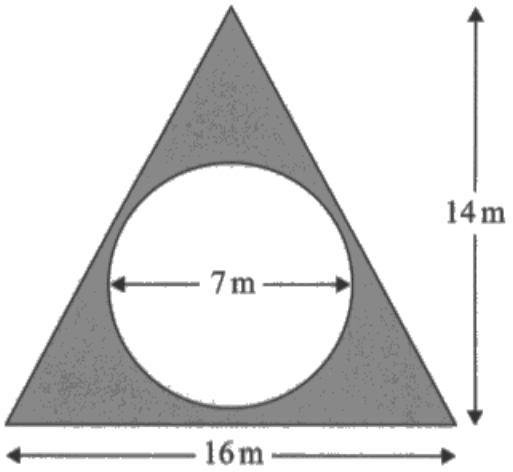
Tam £ 2070

Musa £ 3450

(Total for Question 2 is 3 marks) **3**

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.

Area of triangle: $\frac{14 \times 16}{2} = 112$

Area of circle: $\frac{7}{2} = 3.5$ 3.5 = radius

$\pi \times 3.5^2 = \frac{49}{4}\pi$

A Shaded area: $112 - \frac{49}{4}\pi = 73.5159...$
$= 73.52$ (2 d.p)

Bags needed: $\frac{73.52}{12.5} = 5.88$
$= 6$ (n.w.n)

6 bags

(4) 4 Q03a

1 Q03b

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

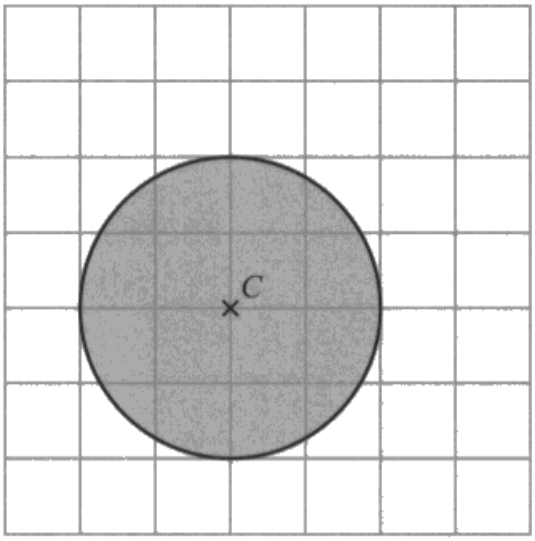
(b) How does this affect your answer to part (a)?

As the bag covers less area more bags will be needed to fill the shaded area.

(1)

(Total for Question 3 is 5 marks) **5**

4 The point C is shown on a centimetre grid. 0 Q04



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.

Circle is not drawn perfectly.

(Total for Question 4 is 1 mark) **0**

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

0 Q05

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

Work out the total weight of potatoes grown last year.

$\frac{1}{5} = 0.2$

Percentage increase: $1 + 0.2 = 1.2$

$8000 \times 1.2 = 9600$

9600 tonnes

(Total for Question 5 is 3 marks) **0**

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.

Total of A: 276 + 400 + 157 + 139

= ~~972~~ 972

~~AA~~ 3 parts = 972

1 part = ~~324~~

Total of B = 5 × 324 = 1620

x = 1620 − 530 − 500 − 270 − 440 − 320

Mean of A = 972 ÷ 4 = 243

+ 3 parts = 243

1 part = ~~81~~ $\frac{243}{3}$ = 81 ✓

5 parts = 81 × 5 = 405

Total of B = 405 × 6 = 2430

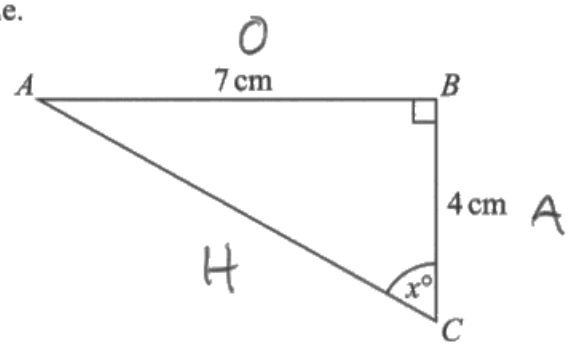
x = 2430 − 530 − 500 − 270 − 440 − 320

x = 370

x = 370

(Total for Question 6 is 5 marks) **5**

7 *ABC* is a right-angled triangle. 2 Q07



Calculate the value of x.
Give your answer correct to 1 decimal place.

TOA:

$\tan^{-1}\left(\frac{7}{4}\right) = 60.255\ldots$

$= 60.3$ (1.d.p)

$x =$ 60.3

(Total for Question 7 is 2 marks) **2**

8 Metal rods are made from steel with density 8 g/cm^3
Each metal rod has a volume of 1500 cm^3 3 Q08

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.

Conversion: 300 kg = 300000 g

Mass of metal rod: 1500 × 8 = 12000 g

Capacity: 300000 ÷ 12000 = 25

25 metal rods

25

(Total for Question 8 is 3 marks) **3**

9 $3x^{-1}(4x - x^3) = a + bx^n$ for all the values of x that are not zero. 2 Q09

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

~~$3(\frac{1}{x})^{-1}(4x - (1)^3) =$~~

$3 \times 4 = 12$

$x^{-1} \times x = 0$

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

$12x - 3x^2$

$a =$ 12

$b =$ −3

$n =$ 2

(Total for Question 9 is 2 marks) **2**

10 Solve $\frac{14 - x}{3} = 3x$ 2 Q10

$\times 3 \quad \times 3$

$14 - x = 9x$

$+x \quad +x$

$14 = 10x$

$\frac{14}{10} = x$

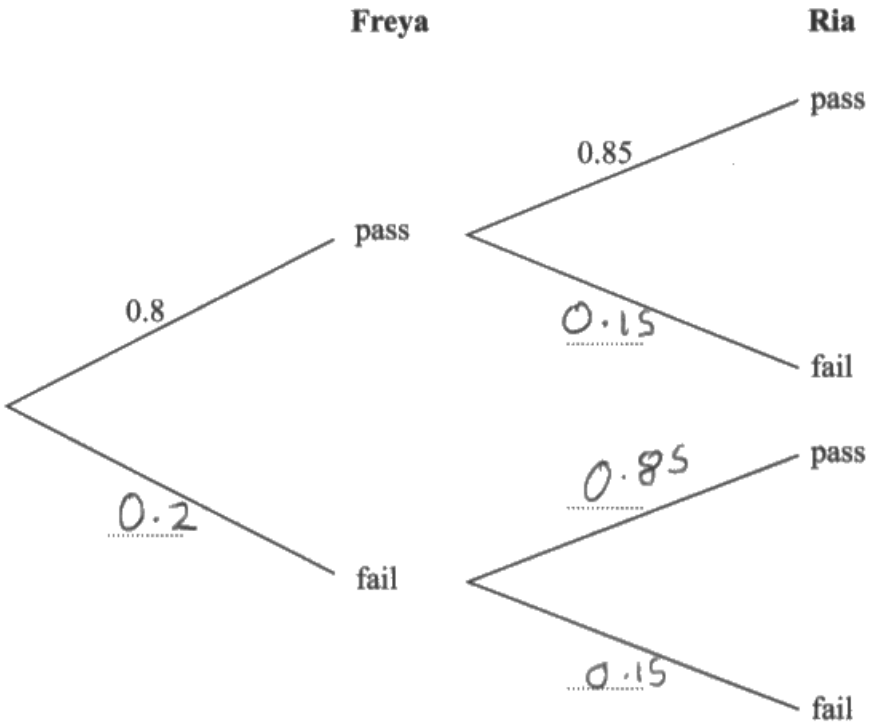
$x =$ $\frac{14}{10}$

(Total for Question 10 is 2 marks) **2**

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.



(2) 2 Q11a

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

$0.8 \times 0.15 = 0.12$

$0.2 + 0.85 = 0.17$

$0.12 + 0.17 = 0.29$

0.29

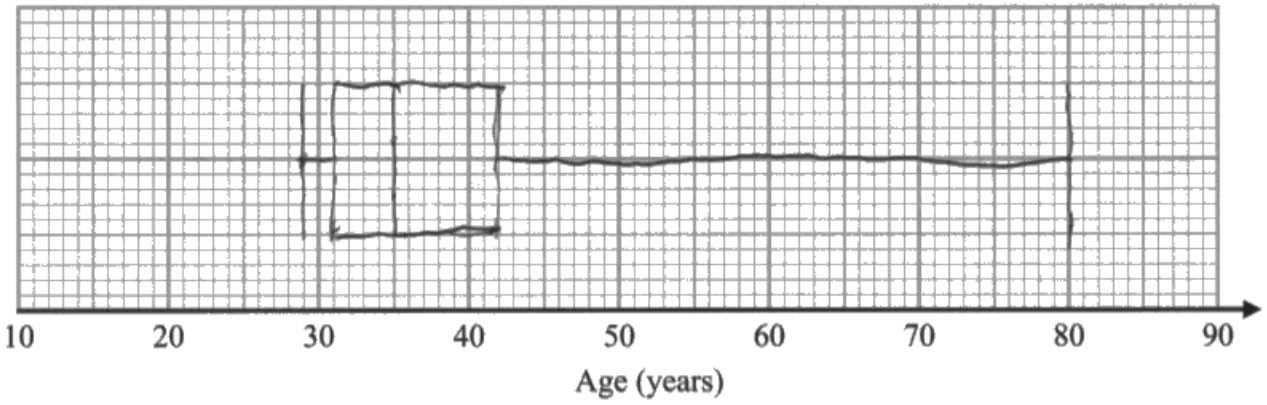
(3) 3 Q11b

(Total for Question 11 is 5 marks) **5**

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.



(3) 2 Q12a

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

$\frac{32}{80} = 0.4 \times 9 = 3.6 = 4$

4

(1) 0 Q12b

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 as the median just shows overall highest age.
~~a~~ half of the ~~total value~~.

(1) 0 Q12c

(Total for Question 12 is 5 marks) 2

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.

2 Q13

$2x^2 - 2x + 3x - 3(x+2)$

$(2x^2 + x - 3)(x+2)$

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

$= 2x^3 + 5x^2 - x + 6$

(Total for Question 13 is 3 marks) **2**

14 There are 15 dogs in a dog show.
One dog is awarded first prize.
A different dog is awarded second prize.

There are 12 cats in a cat show.
One cat is awarded first prize.
A different cat is awarded second prize.

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

0 Q14

Dog: ~~$\frac{2}{15} \times 15 = 30$~~ $\frac{2}{1} \times 15 = 30$

Cats: $\frac{2}{1} \times 12 = 24$

$24 + 30 = 54$

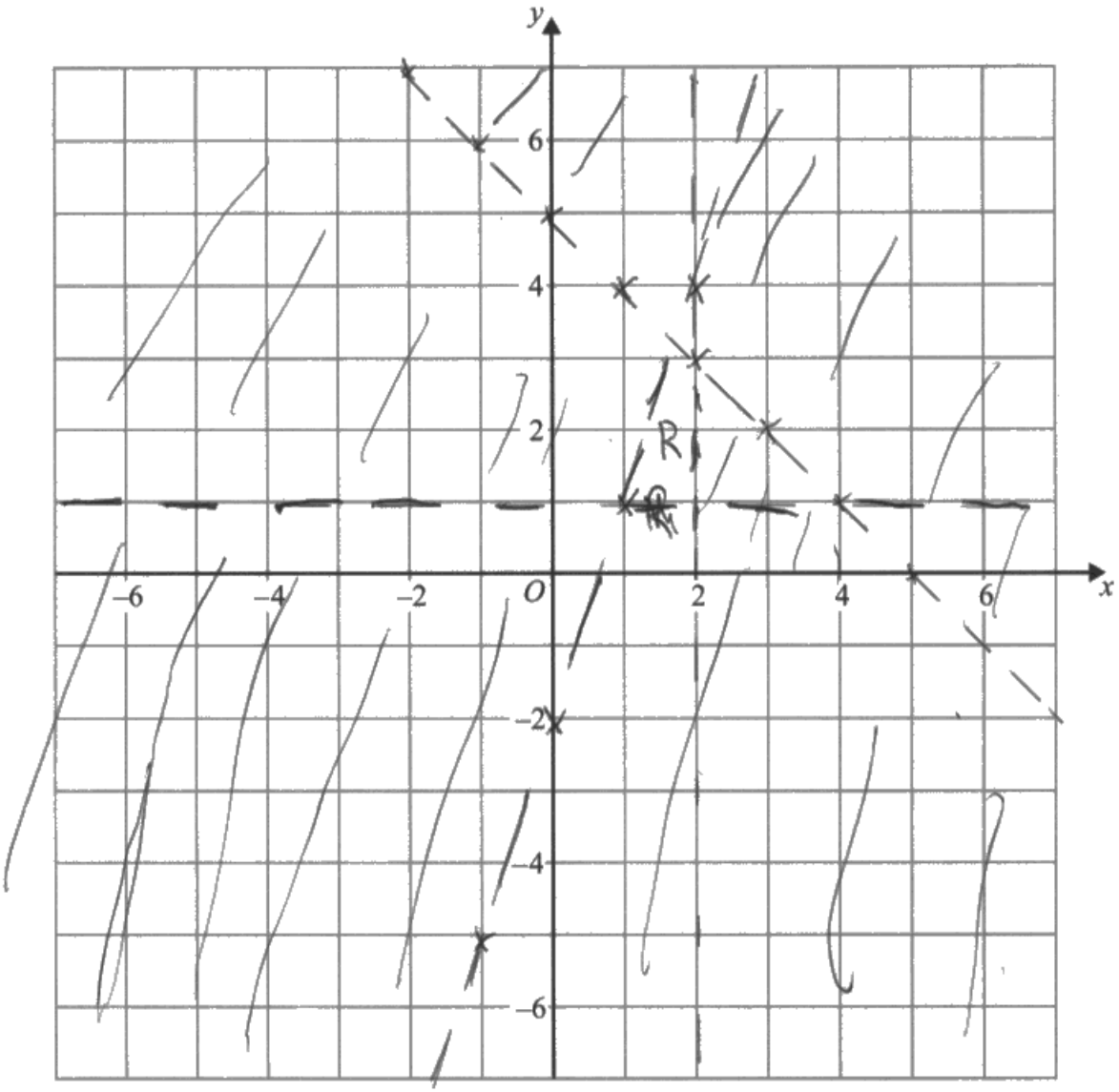
54

(Total for Question 14 is 3 marks) **0**

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

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

Label the region **R**.



(4) 3 Q15a

Ron says,

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

Ron is correct.

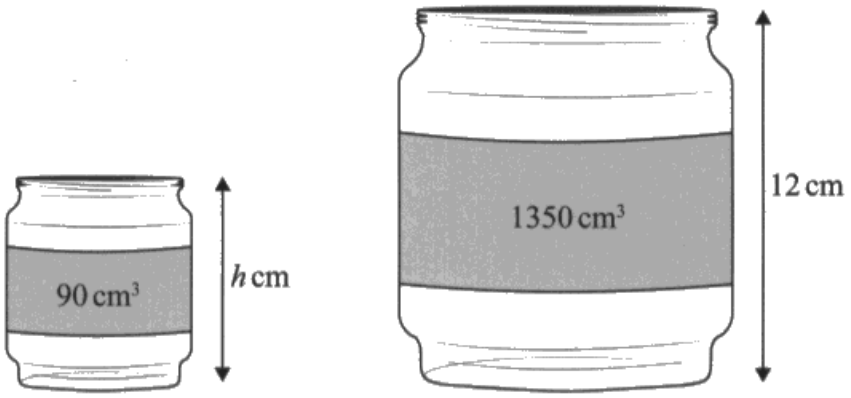
(b) Which inequality can be removed so that the region **R** will not change?

$x + y < 5$

(1) 0 Q15b

(Total for Question 15 is 5 marks) **3**

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.

$\frac{1350}{90} = 15$

$SFV = 15$

$SFh = \frac{2}{3}\sqrt[3]{15}$

$12 \div \sqrt[3]{15} = 4.965\ldots$

$= 4.9$ (1.d.p)

4.9 cm

(4) Q16a

The surface area of the smaller jar is A cm^2
The surface area of the larger jar is pA cm^2

(b) Find the exact value of p.

$SFh = \sqrt[3]{15}$

$SFA = 6.082\ldots$

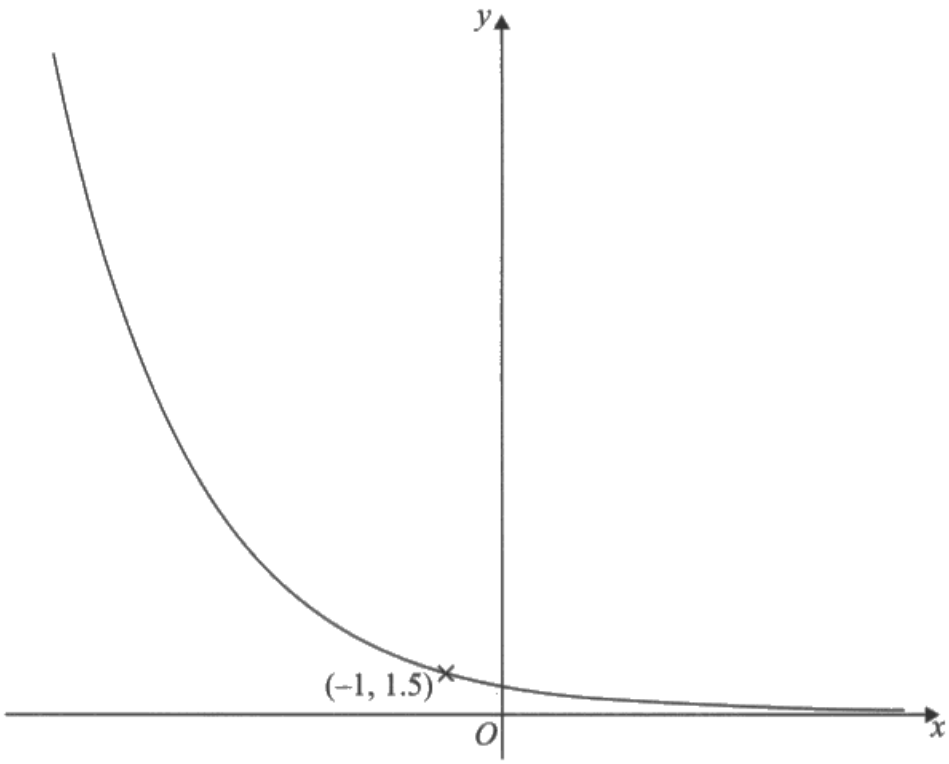
$= 6.1$ (1.d.p)

$p =$ 6.1

(1) Q16b

(Total for Question 16 is 5 marks) 4

17 Here is a sketch of part of the graph of $y = k^x$ where k is a positive constant. 2 Q17



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

Find the value of k.

$y = ab^x$

$1.5 = ab^{-1}$

$1.5 = k^{-1}$

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

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

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

(Total for Question 17 is 2 marks) **2**

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}

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

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

3 Q18

2000 → 2400

$2400 = K\,2000$

$\frac{2400}{2000} = K$

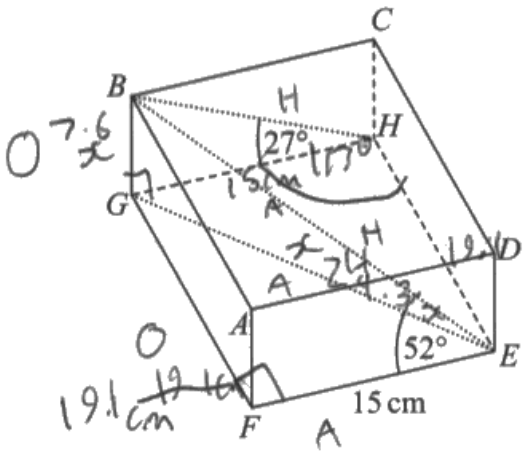
$K = \frac{6}{5}$

2021: $\frac{6}{5} \times 2400 = 2880$

2022: $\frac{6}{5} \times 2880 = 3456$

(Total for Question 18 is 3 marks) **3**

19 *ABCDEFGH* is a cuboid. 4 Q19



Angle $GEF = 52°$
Angle $BHG = 27°$
$EF = 15$ cm

Work out the size of angle GEB.
Give your answer to the nearest degree.

$\frac{15}{\cos 52} = 24.3$ cm (1.d.p)

CAH
~~SOH~~:

$GF = HE$

$BHE = 27 + 90 = 117$

Sine: $\frac{x}{\sin 52} = \frac{24.3}{\sin 90}$

$x = \frac{24.3}{\sin 90} \times \sin 52 = 19.1$ cm (1.d.p)

$HE = 19.1$ cm

$BGH =$ TOA; $\tan 27 \times 15 = 7.6$ (1.d.p)

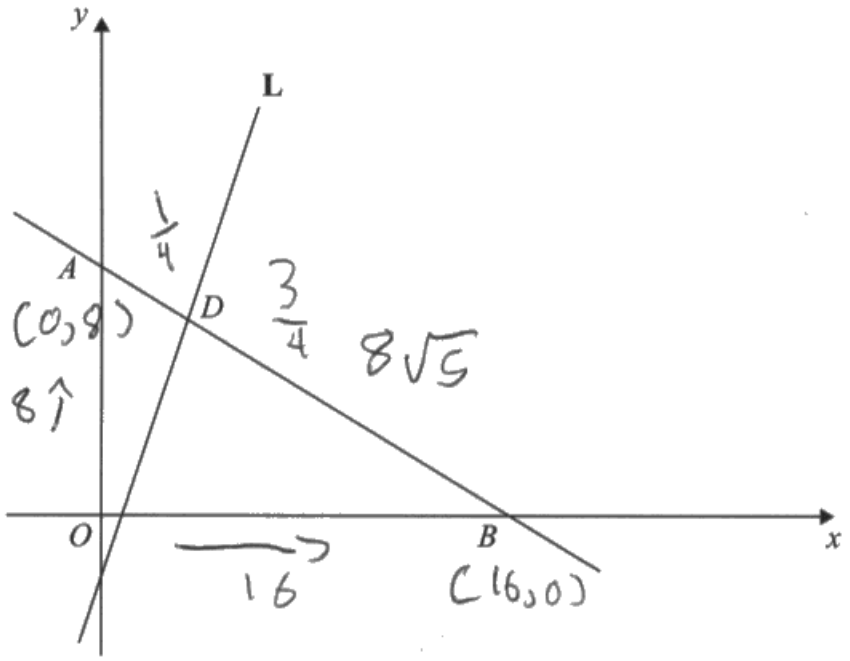
$BGEB =$ TOA: $\tan^{-1}\left(\frac{7.6}{24.3}\right) = 17.36..$
$= 17$ (n.d)

17 °

(Total for Question 19 is 4 marks) **4**

20

0 Q20



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 $f < -4$

$AB = \sqrt{8^2 + 16^2} = 8\sqrt{5}$

~~$\frac{1}{4} \times 8\sqrt{5} = 2\sqrt{5}$~~

$m = \sqrt{3}$

$p \cdot m = -\frac{1}{\sqrt{3}}$ $\quad c = 8$

$y = mx + c$

$y = -\frac{1}{\sqrt{3}}x + 8$

$y = -\frac{1}{\sqrt{3}}(-2) + 8$

(Total for Question 20 is 5 marks)

0

21 Solve $(3x - 1)(5x + 2) < 0$

0 Q21

$15x^2 + 6x - 5x - 2$

$15x^2 + x - 2 < 0$

$(15x + 2)(3x - 1) < 0$

$x = -2 \quad x = \frac{1}{3}$

$x < -2 \quad x > \frac{1}{3}$

$x < -2 \quad x > \frac{1}{3}$

(Total for Question 21 is 2 marks) **0**

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

2 Q22

$r^2 = 25$

$r = 5$

$y = 5, -5$ ~~-2~~

$5 - 2 = 3$

$-5 - 2 = -7$

$0 - 2 = -2$

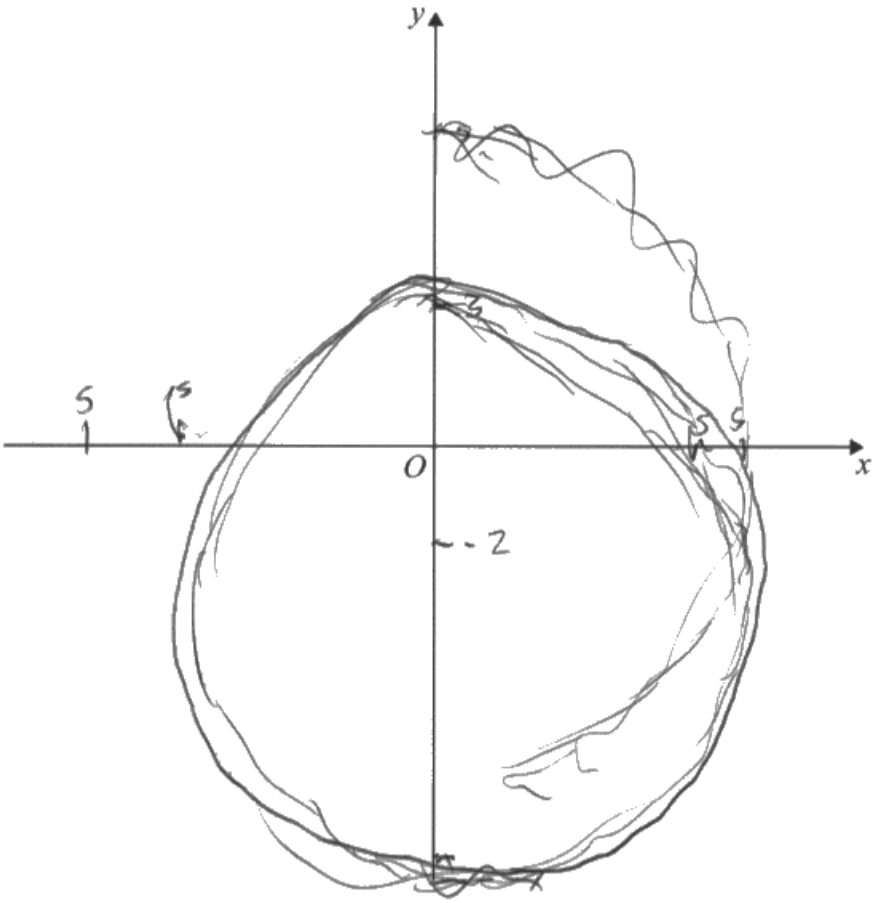
Circle **A** is translated by the vector $\begin{pmatrix} 0 \\ -2 \end{pmatrix}$ to give circle **B**.

Sketch circle **B**.

Show the coordinates of

the centre of circle **B**

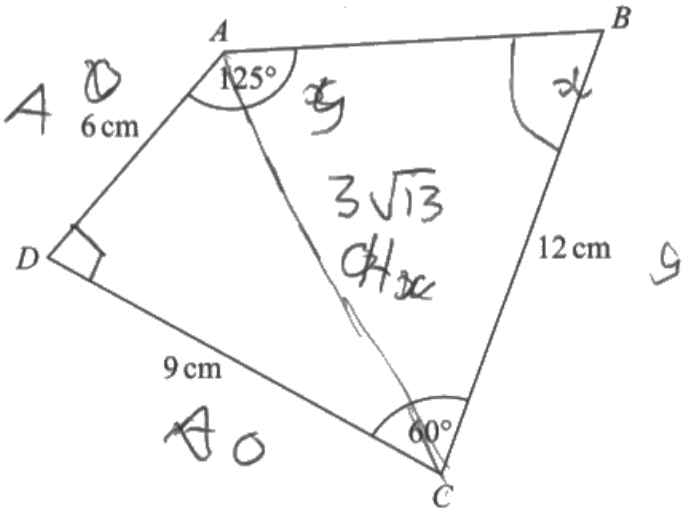
and the points where circle **B** meets the y-axis.



(Total for Question 22 is 3 marks)

2

23 *ABCD* is a quadrilateral. 0 Q23



Find the size of angle *ABC*.
Give your answer correct to the nearest degree.

$AC = \sqrt{6^2 + 9^2} = 3\sqrt{13}$

$\frac{\sin x}{x} = \frac{\sin y}{y}$

$y = CAB$

$CAB = DAB - DAC$

$DAB = 125$

$DAC = \tan^{-1}\left(\frac{9}{6}\right) = 56.3 \text{ (1.d.p)}$

$125 - 53.6 = 71.4 = CAB$

$\frac{\sin x}{3\sqrt{13}} = \frac{\sin 71.4}{12}$

$\sin x = \sin\left(\frac{\sin 71.4}{12} \times 3\sqrt{13}\right) = 58.6$ 59 °

(Total for Question 23 is 5 marks) **0**

TOTAL FOR PAPER IS 80 MARKS

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