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 5 November 2025

Morning (Time: 1 hour 30 minutes)

Paper reference **1MA1/1H**

Mathematics

PAPER 1 (Non-Calculator)

Higher Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB or B pencil, eraser, 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 not be used**.

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 ▶

P78236A

M:1/1/1/1/1/1/

P 7 8 2 3 6 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) Expand and simplify $5(x + 6) + 2(7 - x)$

$5x + 30 + 14 - 2x$

$3x + 44$

$3x + 44$

(2)

(b) Factorise fully $9y^2 - 15y$

HCF of 9 and 15 = 3

HCF of y^2 and y = y

$3y(3y - 5)$

$3y \times 3y = 9y^2$

$3y \times -5 = -15y$

$3y(3y - 5)$

(2)

(c) Write down the value of 2^0

$x^0 = 1$

1

(1)

(Total for Question 1 is 5 marks)

2 Ian cycled 44 kilometres in 2 hours and 12 minutes.

Work out Ian's average speed.
Give your answer in kilometres per hour.

D
S T

$S = \frac{D}{T}$

D = 44km

T = 2h 12 mins
= $2\frac{12}{60}$ h
= 2.2h

$\frac{12}{60} = \frac{1}{5} = 0.2$

$S = \frac{44}{2.2}$ ×10 ×10

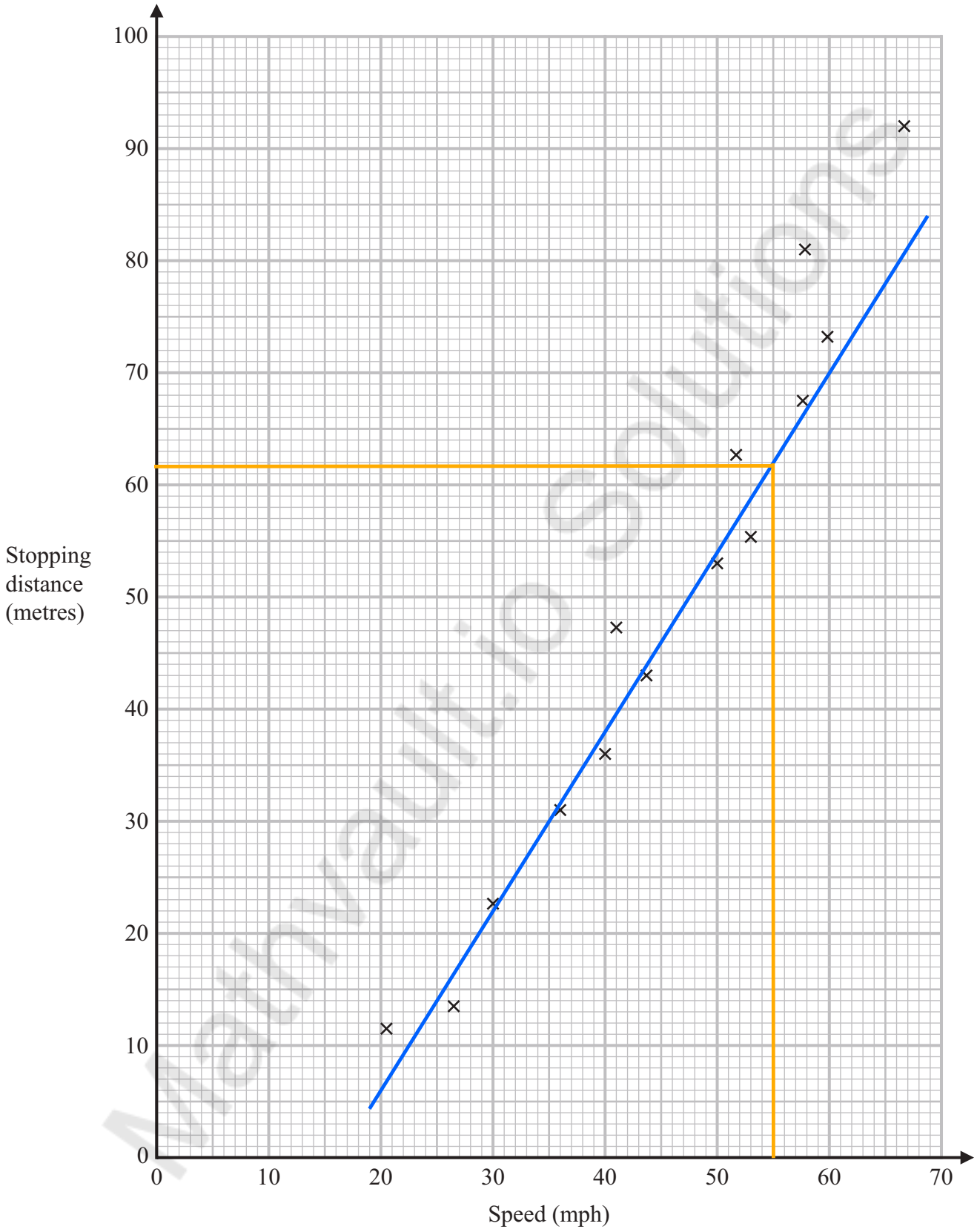
$= \frac{440}{22}$

= 20 km/h

20 kilometres per hour

(Total for Question 2 is 3 marks)

3 The scatter graph shows the stopping distances for some cars travelling at different speeds.



(a) What type of correlation does the scatter graph show?

Positive

(1)

Another car is travelling at a speed of 55 mph.

(b) Estimate the stopping distance for this car.

62 metres

(2)

Sanar says,

"It would not be sensible to use the scatter graph to estimate the stopping distance of a car travelling at a speed of 10 mph, because the estimate would not be reliable."

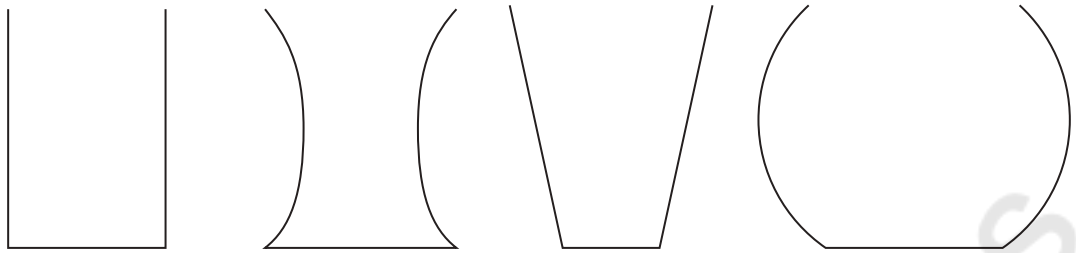
(c) Is Sanar correct?
You must give a reason for your answer.

Yes, it is outside the range of data.

(1)

(Total for Question 3 is 4 marks)

4 **A**, **B**, **C** and **D** are four containers.

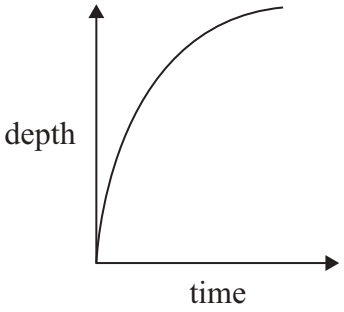


A **B** **C** **D**

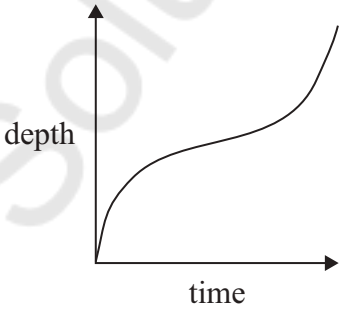
Water is poured into the containers at a constant rate.

The sketch graphs below show the depth of water in each container, t seconds after the water starts to be poured.

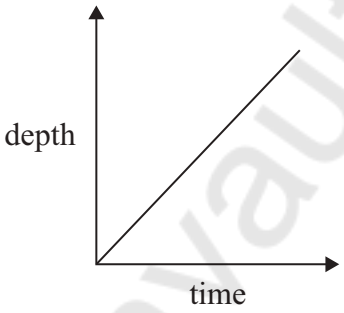
Graph 1



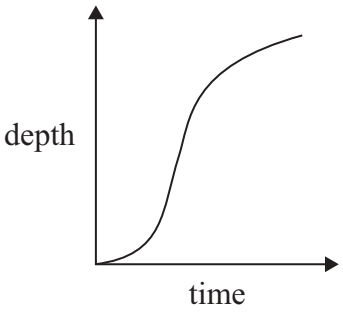
Graph 2



Graph 3



Graph 4

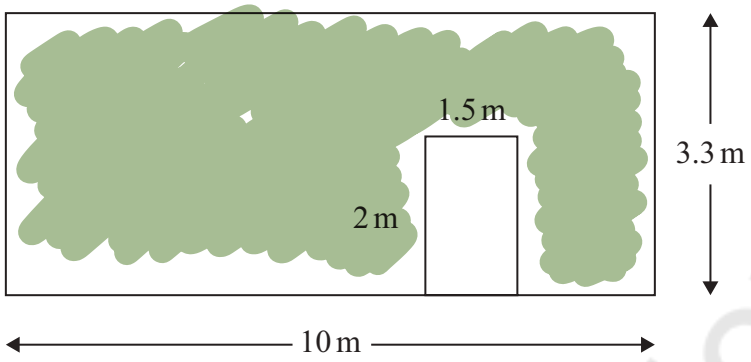


Match each graph to the correct container.

Container	Graph
A	3
B	4
C	1
D	2

(Total for Question 4 is 2 marks)

5 The diagram shows a rectangular wall, 10 metres by 3.3 metres.
A rectangular door in the wall is 2 metres by 1.5 metres.



Zac is going to mix yellow paint and blue paint in the ratio 1 : 4 to paint the wall.
He will **not** paint the door.

Zac assumes 1 litre of paint will cover 10 m^2

Yellow paint is sold in 1 litre tins costing £4.75 each.
Blue paint is sold in 1 litre tins costing £5.50 each.

Zac has £20 to buy paint.

(a) Does Zac have enough money to buy all the paint he needs?
You must show all your working.

Shaded area = Wall area - Door area

= 10 x 3.3 - 2 x 1.5

= 33 - 3

= 30 m^2

30 m^2 → 3L needed

Y : B
1 : 4

5 parts total

3 ÷ 5 = 0.6L

Y = 0.6L → 1 tin = £4.75

B = 3 - 0.6L
= 2.4L → 3 tins = £5.50 = £16.50

Cost = £4.75 + £16.50 = £21.25 No (5)

Zac's assumption is wrong, and 1 litre of paint will cover more than 10 m^2

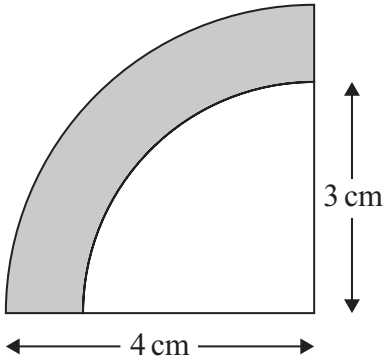
(b) How might this affect your answer to part (a)?
You must explain your answer.

We can't tell as it depends on how much more it will cover.

(1)

(Total for Question 5 is 6 marks)

6 The diagram shows two quarter circles with the same centre.



Area = $\frac{1}{4}\pi r^2$

Work out the area of the shaded section.
Give your answer in terms of π.

Shaded region = Larger $\frac{1}{4}$ circle − Smaller $\frac{1}{4}$ circle

$= \frac{1}{4}\pi(4)^2 - \frac{1}{4}\pi(3)^2$

$= \frac{1}{4}\pi(16) - \frac{1}{4}\pi(9)$

$= 4\pi - \frac{9}{4}\pi$

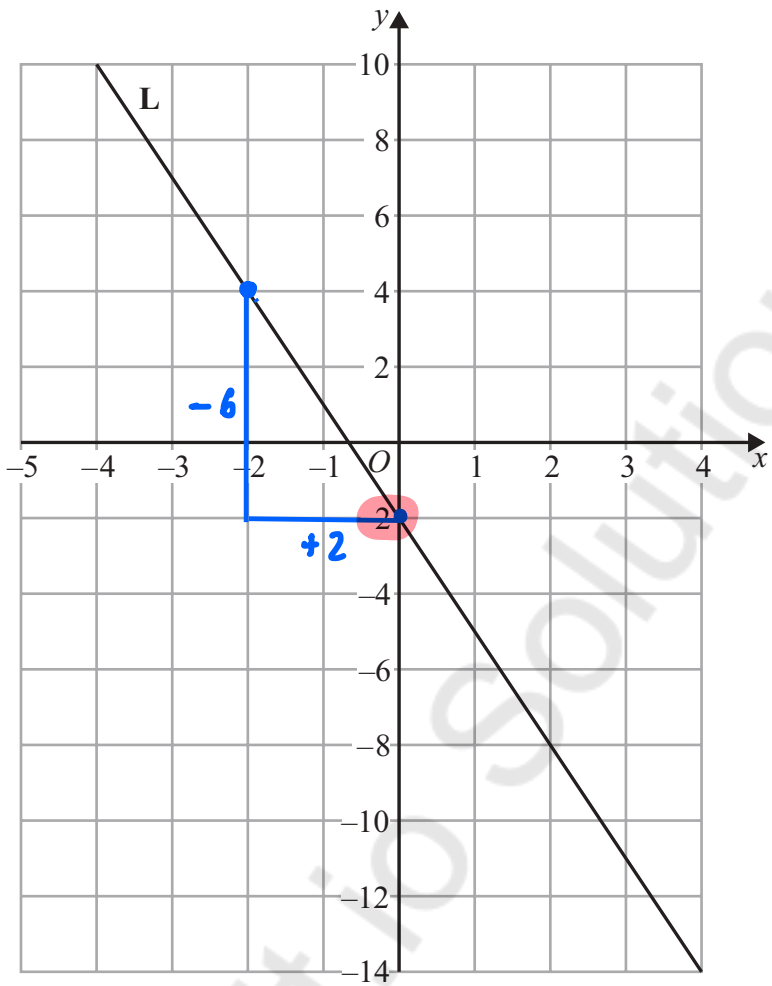
$= \frac{16}{4}\pi - \frac{9}{4}\pi$

$= \frac{7}{4}\pi \text{ cm}^2$

$\frac{7}{4}\pi$ ..... cm^2

(Total for Question 6 is 3 marks)

7 The line **L** is shown on the grid.



Find an equation for **L**.
Give your answer in the form $y = mx + c$ ← y-intercept

↑ gradient

$m = \frac{\text{change in } y}{\text{change in } x} = \frac{-6}{2} = -3$ $\quad c = -2$

$y = -3x - 2$

(Total for Question 7 is 3 marks)

8 Dwayne buys 20 rulers for 40p each.

Dwayne sells 15 of the rulers.
He sells each ruler for the same price.
Dwayne makes a 50% profit on the price he paid for all 20 rulers.

Work out how much Dwayne sells each of the 15 rulers for.
You must show all your working.

Paid = 20 x 40p
= 800p or £8

Profit 50% of £8 = £4
£8 + £4 = £12 or 1200p

1200 ÷ 15 = 80

```
    80
15 ⟌1200
```

80 p

(Total for Question 8 is 4 marks)

9 The table below shows information about the ages, in months, of the children in a nursery.

Least age	7
Median	22
Upper quartile	29
Interquartile range	15
Range	25

IQR = UQ - LQ
LQ = UQ - IQR

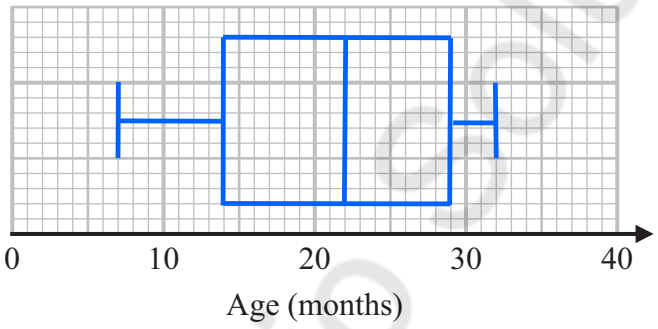
Lower Quartile = 29 - 15
= 14

Range = highest - lowest

Highest = range + lowest

Highest age = 25 + 7
= 32

Draw a box plot for this information.



(Total for Question 9 is 3 marks)

10 $\mathbf{a} = \begin{pmatrix} 1 \\ -7 \end{pmatrix}$ $\mathbf{c} = \begin{pmatrix} 17 \\ -19 \end{pmatrix}$

Given that $4\mathbf{a} - 5\mathbf{b} = 2\mathbf{c}$

find $\mathbf{b}$ as a column vector.

$$4a = 4 \times \begin{pmatrix} 1 \\ -7 \end{pmatrix} = \begin{pmatrix} 4 \\ -28 \end{pmatrix}$$

$$2c = 2 \times \begin{pmatrix} 17 \\ -19 \end{pmatrix} = \begin{pmatrix} 34 \\ -38 \end{pmatrix}$$

$$\begin{pmatrix} 4 \\ -28 \end{pmatrix} - 5b = \begin{pmatrix} 34 \\ -38 \end{pmatrix}$$

$$-5b = \begin{pmatrix} 34 \\ -38 \end{pmatrix} - \begin{pmatrix} 4 \\ -28 \end{pmatrix}$$

$$-5b = \begin{pmatrix} 30 \\ -10 \end{pmatrix}$$

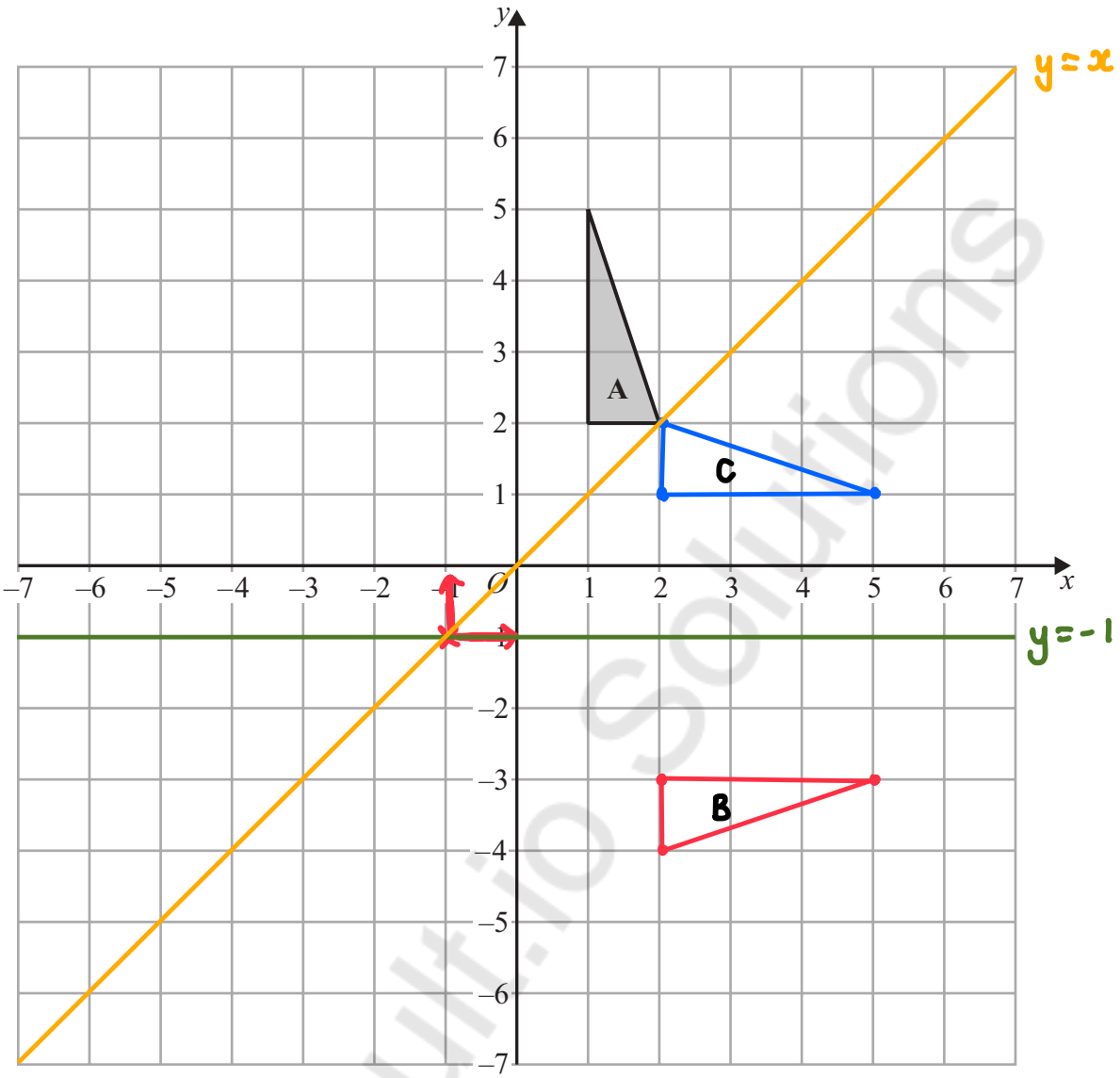
$\div -5 \qquad \div -5$

$$b = \begin{pmatrix} -6 \\ 2 \end{pmatrix}$$

$\begin{pmatrix} -6 \\ 2 \end{pmatrix}$

(Total for Question 10 is 4 marks)

11



Shape **A** is rotated 90° clockwise about the point (−1, −1) to give shape **B**.

Shape **B** is reflected in the line $y = -1$ to give shape **C**.

Describe fully the single transformation that maps shape **A** onto shape **C**.

Reflection in y = x

(Total for Question 11 is 3 marks)

12 Express $0.07\dot{2}\dot{4}$ as a fraction.

$x = 0.07\dot{2}\dot{4}$

$100x = 7.\dot{2}\dot{4}$

$10{,}000x = 724.\dot{2}\dot{4}$

$10{,}000x - 100x = 9900x$

$724.\dot{2}\dot{4} - 7.\dot{2}\dot{4} = 717$

$9900x = 717$

$x = \frac{717}{9900}$

$\frac{717}{9900}$

(Total for Question 12 is 3 marks)

13 A cafe menu has

4 starters
7 main courses
5 desserts

Work out how many possible combinations of 1 starter, 1 main course and 1 dessert there are.

$4 \times 7 \times 5$

$= 28 \times 5$

$= 140$

140

(Total for Question 13 is 2 marks)

14 Solve $6x(2x + 3) = 11x - 1$

$12x^2 + 18x = 11x - 1$

$-11x + 1 \quad -11x + 1$

$12x^2 + 7x + 1 = 0$

$12 \times 1 = 12$

$+4 \times +3 = 12$

$+4 + +3 = 7$

$12x^2 + 4x + 3x + 1$

$4x(3x + 1) + 1(3x + 1)$

$(4x + 1)(3x + 1) = 0$

$4x + 1 = 0 \qquad 3x + 1 = 0$

$-1 \quad -1 \qquad -1 \quad -1$

$4x = -1 \qquad 3x = -1$

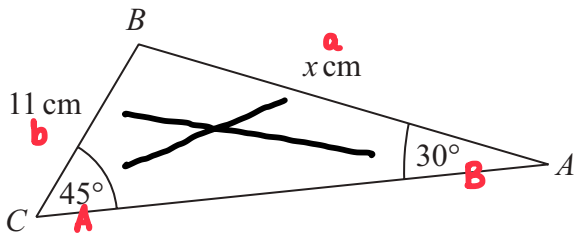
$\div 4 \quad \div 4 \qquad \div 3 \quad \div 3$

$x = -\frac{1}{4} \qquad x = -\frac{1}{3}$

$x = -\frac{1}{4}$ and $-\frac{1}{3}$

(Total for Question 14 is 4 marks)

15 Here is triangle ABC.



Show that x can be written in the form $d\sqrt{e}$ where d and e are integers.

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

$$\frac{x}{\sin 45} = \frac{11}{\sin 30}$$

$$\frac{x}{\frac{\sqrt{2}}{2}} = \frac{11}{\frac{1}{2}}$$

$$x \div \frac{\sqrt{2}}{2} \qquad 11 \div \frac{1}{2}$$

$$x \times \frac{2}{\sqrt{2}} \qquad 11 \times \frac{2}{1}$$

$$\frac{2x}{\sqrt{2}} \qquad 22$$

	0°	30°	45°	60°	90°
sin	0	1	2	3	4
cos	4	3	2	1	0

2

$$\frac{2x}{\sqrt{2}} = 22$$

$$2x = 22\sqrt{2}$$

$$x = 11\sqrt{2}$$

(Total for Question 15 is 3 marks)

16 Solve $\frac{4x+2}{3} - \frac{5x-6}{5} = \frac{10x+3}{15}$

You must show all your working.

$$\frac{5(4x+2) - 3(5x-6)}{15}$$

$$\frac{20x + 10 - 15x + 18}{15}$$

$$\frac{5x + 28}{15} = \frac{10x + 3}{15}$$

$\times 15$ $\times 15$

$$5x + 28 = 10x + 3$$

$$-5x \quad -5x$$

$$28 = 5x + 3$$

$$-3 \quad -3$$

$$25 = 5x$$

$$\div 5 \quad \div 5$$

$$5 = x$$

$x =$ 5

(Total for Question 16 is 4 marks)

17 Find the coordinates of the turning point of the graph of $y = 5x^2 + 4x + 9$

$$y = 5\left(x^2 + \frac{4}{5}x + \frac{9}{5}\right)$$

$$= 5\left[\left(x + \frac{2}{5}\right)^2 - \left(\frac{2}{5}\right)^2 + \frac{9}{5}\right]$$

$$= 5\left[\left(x + \frac{2}{5}\right)^2 - \frac{4}{25} + \frac{9}{5}\right]$$

$$= 5\left[\left(x + \frac{2}{5}\right)^2 + \frac{41}{25}\right]$$

$$\frac{4}{5} \div 2 = \frac{4}{5} \times \frac{1}{2} = \frac{4}{10} = \frac{2}{5}$$

$$\frac{-4}{25} + \frac{9}{5} = \frac{-4}{25} + \frac{45}{25} = \frac{41}{25}$$

$$x + \frac{2}{5} = 0$$

$$x = -\frac{2}{5} \qquad y = \frac{41}{25}$$

($\frac{-2}{5}$, $\frac{41}{25}$)

(Total for Question 17 is 4 marks)

18 In bag **A**,

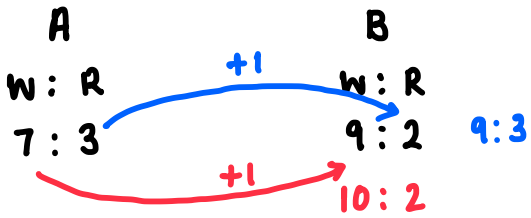
number of white counters : number of red counters = 7 : 3

In bag **B**, there are 9 white counters and 2 red counters.
In bag **C**, there are 11 white counters and 4 red counters.

Faisal takes at random a counter from bag **A** and puts the counter in bag **B**.
He then takes at random a counter from bag **B** and puts the counter in bag **C**.

Find the probability that there is now an even number of white counters in bag **C**.

↳ 12 white



White Counter $p(A) = \frac{7}{10}$ $p(B) = \frac{10}{12}$ $\frac{7}{10} \times \frac{10}{12} = \frac{70}{120}$

Red Counter $p(A) = \frac{3}{10} \times p(\text{white counter from bag B}) = \frac{9}{12}$ $\frac{3}{10} \times \frac{9}{12} = \frac{27}{120}$

$$\frac{70}{120} + \frac{27}{120} = \frac{97}{120}$$

$\frac{97}{120}$

(Total for Question 18 is 4 marks)

19 $9^{2x} \times 27^2 \times 81^{3x-2} = \dfrac{1}{3^{18}}$

Find the value of x.
You must show all your working.

$9^{2x} = (3^2)^{2x}$
$= 3^{4x}$

$27^2 = (3^3)^2$
$= 3^6$

$81^{3x-2} = (3^4)^{3x-2}$
$= 3^{12x-8}$

$\dfrac{1}{3^{18}} = 3^{-18}$

$3^{4x} \times 3^6 \times 3^{12x-8} = 3^{-18}$

$3^{4x+6+12x-8} = 3^{-18}$

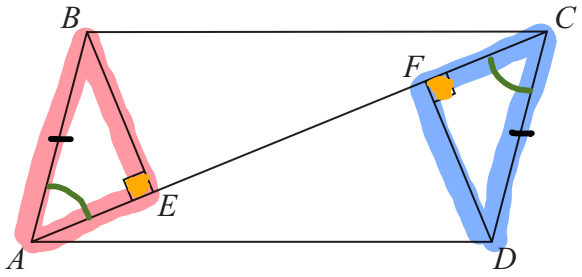
$3^{16x-2} = 3^{-18}$

$16x - 2 = -18$
$+2 \quad +2$
$16x = -16$
$\div 16 \quad \div 16$
$x = -1$

$x =$ -1

(Total for Question 19 is 4 marks)

20 *ABCD* is a parallelogram.
AEFC is a straight line.



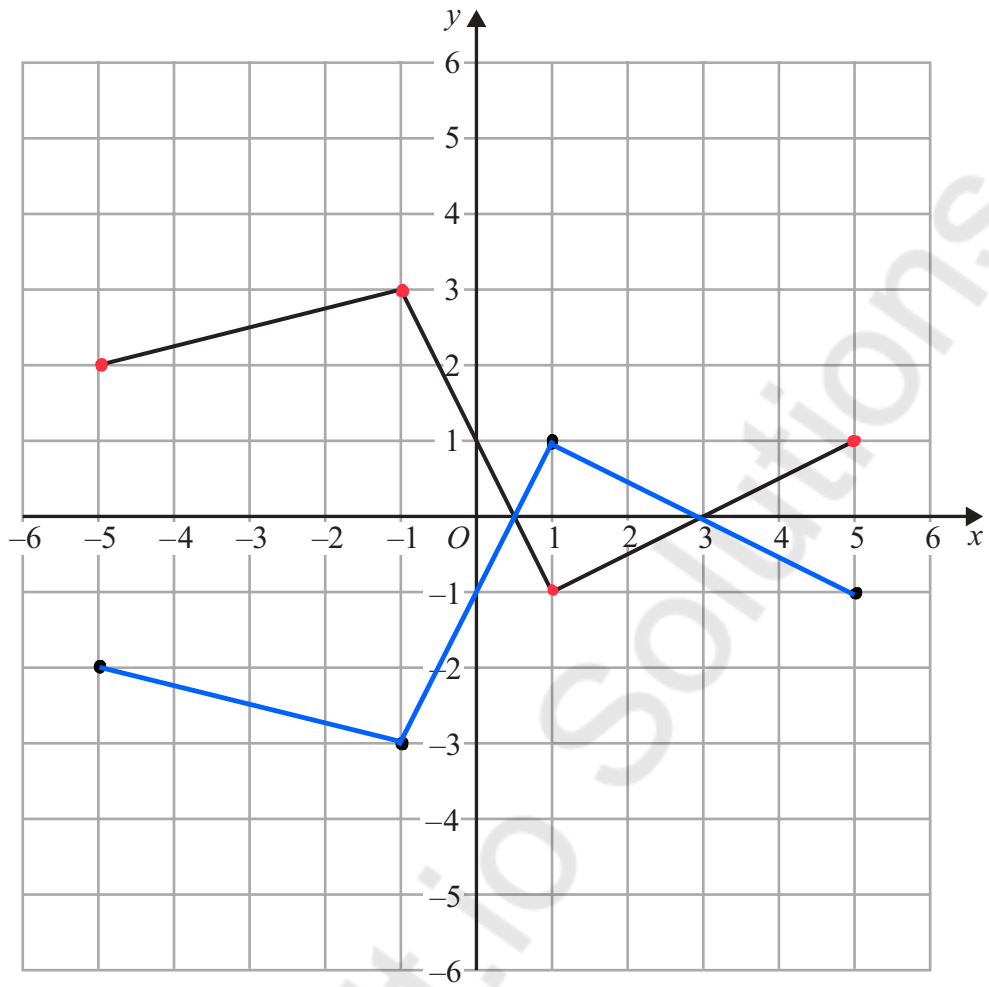
Prove that triangle *ABE* and triangle *CDF* are congruent.

- AB = CD opposite sides of a parallelogram are equal.
- ∠EAB = ∠FCD alternate angles are equal
- ∠BEA and ∠CFD are both 90°

Congruent because ASA

(Total for Question 20 is 3 marks)

21 Here is the graph of $y = f(x)$



x y by -1

(a) On the grid, draw the graph of $y = -f(x)$

(2)

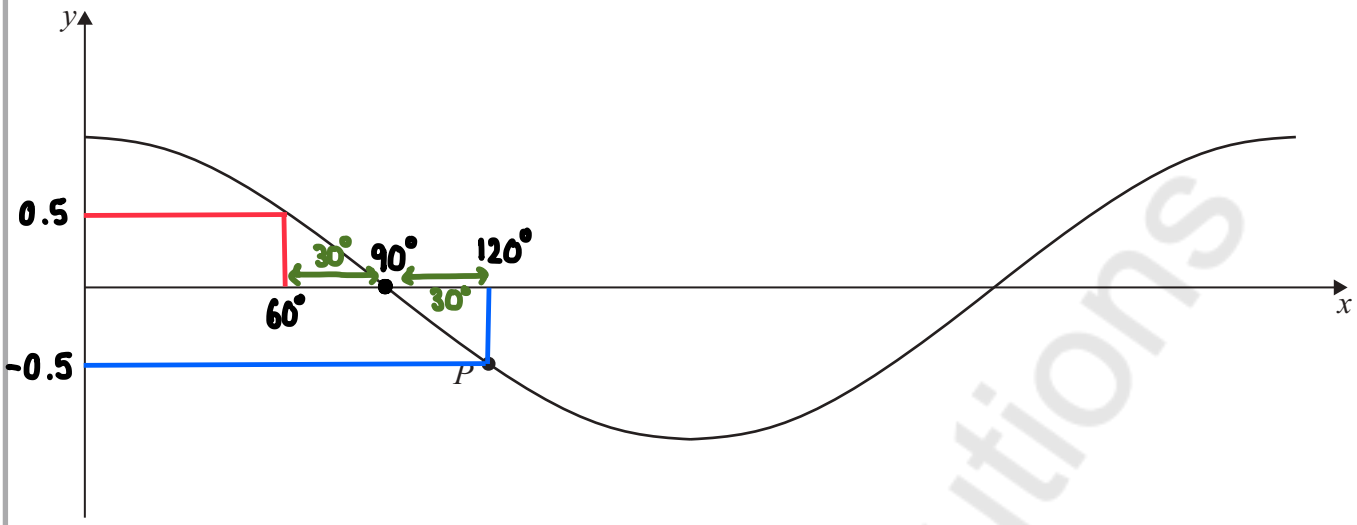
(-5, 2) → (-5, -2)

(-1, 3) → (-1, -3)

(1, -1) → (1, 1)

(5, 1) → (5, -1)

Here is a sketch of the graph of $y = \cos x°$



Point P, shown on the graph, has a y coordinate of -0.5

The graph of $y = \cos x°$ is transformed to give the graph of $y = \cos(x - 60)° + 2$
The transformation maps point P to point Q.

$x + 60$ $y + 2$

(b) Work out the exact coordinates of point Q.

	0°	30°	45°	60°	90°
sin	0	1	2	3	4
cos	4	3	2	1	0

2

$\cos(60) = \frac{\sqrt{1}}{2} = \frac{1}{2}$

$\cos^{-1}\left(\frac{1}{2}\right) = 60°$

$\cos^{-1}\left(-\frac{1}{2}\right) = 120°$

P(120, -0.5)

+60 +2

Q(180, 1.5)

(180 , 1.5)

(3)

(Total for Question 21 is 5 marks)

Turn over for Question 22

22 Write $\dfrac{\sqrt{3}+1}{\sqrt{27}+4}$ in the form $\dfrac{a+b\sqrt{c}}{d}$ where a, b, c and d are integers.

$\sqrt{27} = \sqrt{9} \times \sqrt{3}$

$= 3 \times \sqrt{3}$

$= 3\sqrt{3}$

$$\frac{\sqrt{3}+1}{3\sqrt{3}+4} \times \frac{3\sqrt{3}-4}{3\sqrt{3}-4}$$

$$\frac{(\sqrt{3}+1)(3\sqrt{3}-4)}{(3\sqrt{3}+4)(3\sqrt{3}-4)}$$

$\sqrt{3} \times 3\sqrt{3} = 3\sqrt{9}$

$= 3 \times 3$

$= 9$

$3\sqrt{3} \times 3\sqrt{3} = 9\sqrt{9}$

$= 9 \times 3$

$= 27$

$$\frac{9 - 4\sqrt{3} + 3\sqrt{3} - 4}{27 - 12\sqrt{3} + 12\sqrt{3} - 16}$$

$$\frac{5-\sqrt{3}}{11}$$

$\dfrac{5-\sqrt{3}}{11}$

(Total for Question 22 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS