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Candidate surname					Other names				
Centre Number					Candidate Number				
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## Pearson Edexcel International GCSE

Time 2 hours

Paper  
reference

**4MA1/1FR**

### Mathematics A

**PAPER: 1FR**  
**Foundation Tier**



**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- **Calculators may be used.**
- You must **NOT** write anything on the formulae page.  
Anything you write on the formulae page will gain **NO** credit.

### Information

- The total mark for this paper is 100.
- 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.
- Check your answers if you have time at the end.

Turn over ►

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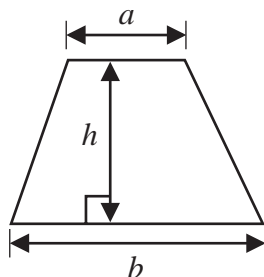
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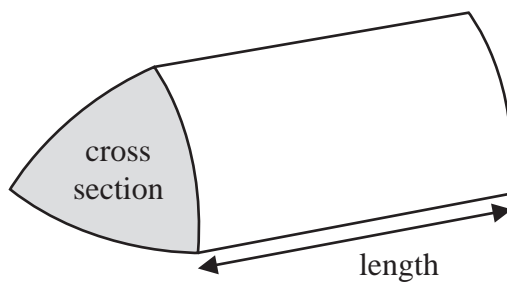
  
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**International GCSE Mathematics**  
**Formulae sheet – Foundation Tier**

**Area of trapezium** =  $\frac{1}{2}(a + b)h$

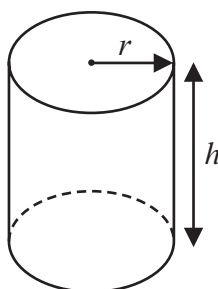


**Volume of prism** = area of cross section  $\times$  length



**Volume of cylinder** =  $\pi r^2 h$

**Curved surface area of cylinder** =  $2\pi r h$



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**Answer ALL TWENTY SEVEN questions.**

**Write your answers in the spaces provided.**

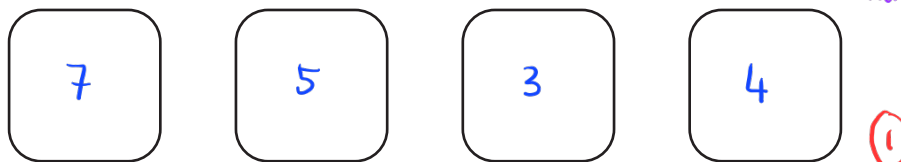
**You must write down all the stages in your working.**

- 1 Here are four cards.  
Each card has a number written on it.



These four cards are arranged to make the number 3457

- (a) Arrange the four cards to make the largest possible even number. *- should end with an even number*



(1)

Darren arranges the cards to make another number.

The difference between the number 3600 and the number that Darren makes is as small as possible.

- (b) Find this difference.

*Nearest number to 3600 should be 3574.*

$$3600 - 3574 = 26$$

(1)                      (1)

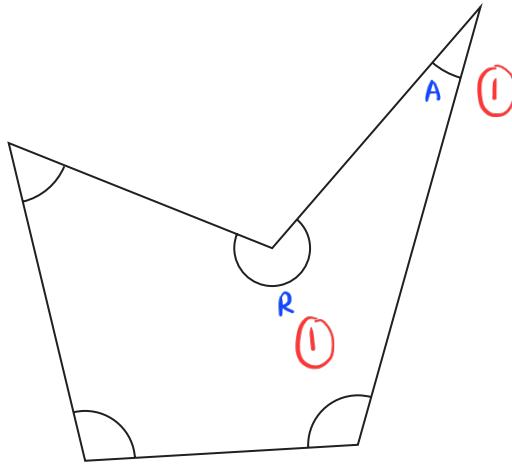
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(2)

**(Total for Question 1 is 3 marks)**



2 Here is a 5-sided polygon.



(a) Write down the mathematical name for a 5-sided polygon.

Pentagon (1)

(1)

(b) On the diagram, mark with a letter *A* an acute angle.

acute angle = less than  $90^\circ$

(1)

(c) On the diagram, mark with a letter *R* a reflex angle.






reflex angle =  $180^\circ < x < 360^\circ$

(1)

(Total for Question 2 is 3 marks)



3 The pictogram shows information about the number of loaves of bread sold in a bakery each day from Tuesday to Friday last week.

Monday	 <span style="color: red;">①</span>
Tuesday	
Wednesday	
Thursday	
Friday	

Key:  represents 6 loaves of bread

(a) How many loaves of bread were sold on Friday?

$$6 \times 3 = 18$$

18 ①

(1)

The total number of loaves sold in the bakery from Monday to Friday last week was 66

(b) (i) Work out the number of loaves sold on Monday last week.

$$\text{Monday} + (2.5 \times 6) + (1.5 \times 6) + (0.5 \times 6) + (3 \times 6) = 66$$

$$\text{Monday} + 15 + 9 + 3 + 18 = 66$$

$$\text{Monday} + 45 = 66$$

$$\text{Monday} = 66 - 45 = 21 \quad \text{①}$$

21

(2)

(ii) Show this information for Monday on the pictogram.

$$\frac{21}{6} = 3.5$$

(1)

(Total for Question 3 is 4 marks)

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4 (a) Write 0.7 as a fraction.

$$\frac{7}{10} \quad (1)$$

(1)

(b) Write a number in the box so that the following statement is correct.

$$\frac{3 \times 5}{4 \times 5} \text{ and } \frac{\boxed{15}}{20} \text{ are equivalent fractions.} \quad (1)$$

(1)

(c) Work out  $\frac{3}{5}$  of 35

$$\frac{3}{5} \times 35 = 21 \quad (1) \quad (1)$$

21

(2)

(Total for Question 4 is 4 marks)

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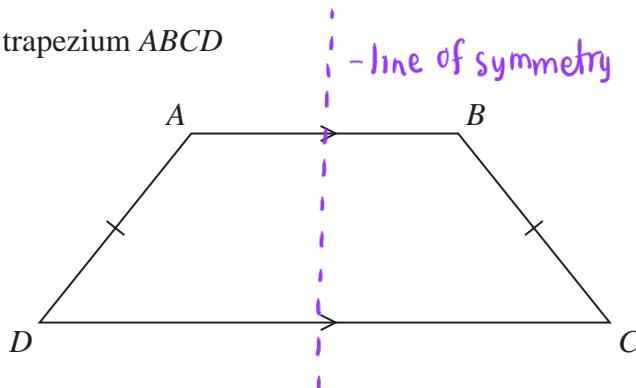


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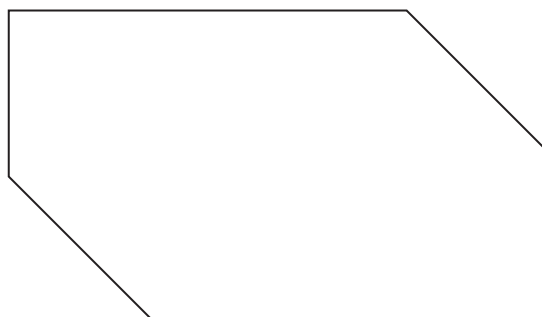
5 The diagram shows the trapezium  $ABCD$



(a) How many lines of symmetry has  $ABCD$ ?

1 (1)

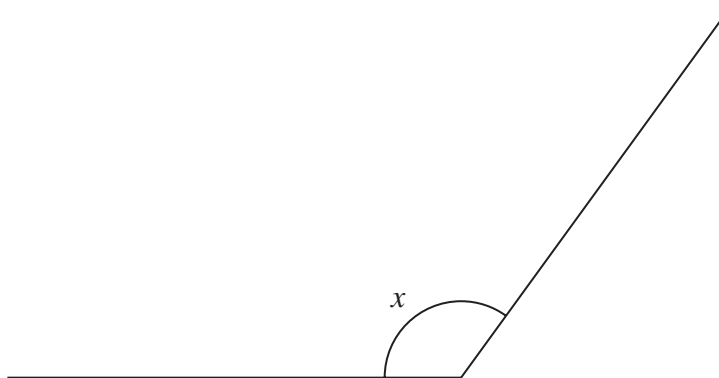
Here is another shape.



(b) Write down the order of rotational symmetry of this shape.

2 (1)

(c) Find, by measuring, the size of the angle marked  $x$



126 (1)

(Total for Question 5 is 3 marks)



6 Here is a list of seven numbers.

5    16    23    27    50    160    240

(a) From the numbers in the list, write down

(i) a cube number

$$3^3 = 27$$

27 (1)

(1)

(ii) a factor of 80

Factor of 80: 1, 2, 4, 5, 8, 10, 16, 20, 40, 80

5, 16 (1)

(1)

Two numbers in the list are prime numbers.

(b) Work out the sum of these two prime numbers.

Prime numbers: 5, 23 (1)

$$5 + 23 = 28 (1)$$

28

(2)

(Total for Question 6 is 4 marks)

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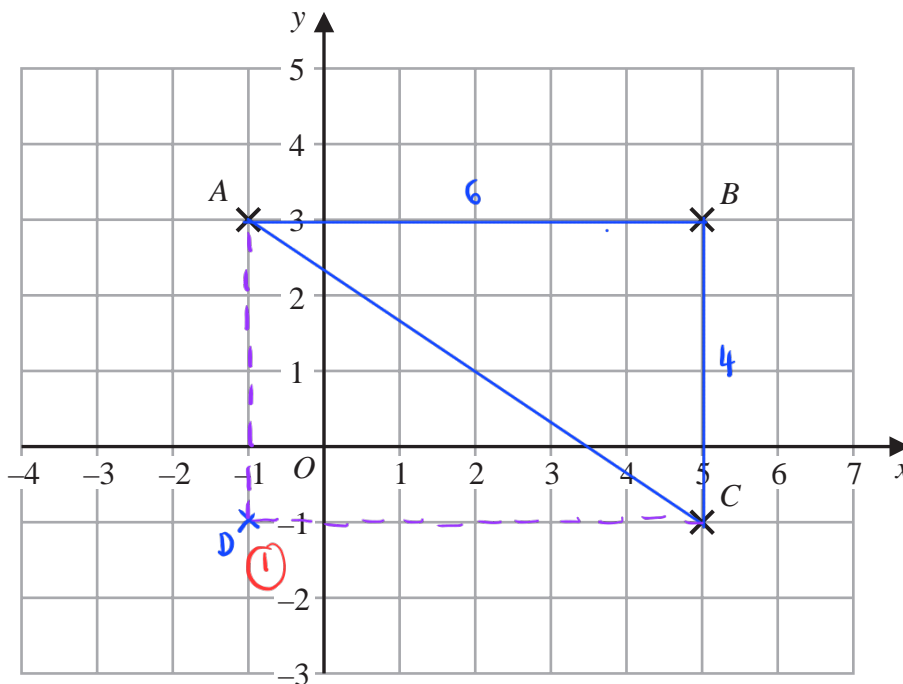
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7 The three points  $A$ ,  $B$  and  $C$  are marked on a centimetre grid.



(a) Write down the coordinates of  $A$

(....., ..... )  
 (1)

(b) Find the coordinates of the midpoint of  $BC$

$B = (5, 3)$  ,  $C = (5, -1)$

midpoint of  $BC = \left( \frac{5+5}{2}, \frac{3+(-1)}{2} \right) = (5, 1)$

(....., ..... )  
 (2)

(c) Work out the area of triangle  $ABC$

Area :  $\frac{1}{2} \times 6 \times 4$  (1)  
 $= 12 \text{ cm}^2$  (1)

.....  $\text{cm}^2$   
 (2)

$D$  is the point on the grid so that  $ABCD$  is a rectangle.

(d) On the grid, mark with a cross ( $\times$ ) the point  $D$   
 Label this point  $D$

(1)

(Total for Question 7 is 6 marks)

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8 Masie is told that  $13203 \div 27 = 489$

Explain how she can use this calculation to work out  $489 \times 28$

$$489 \times 27 = 13203$$

$$\begin{aligned} 489 \times 28 &= (489 \times 27) + (489 \times 1) \\ &= 13203 + 489 \\ &= 13692 \quad (2) \end{aligned}$$

$$\begin{array}{r} 13203 \\ + \quad 489 \\ \hline 13692 \end{array}$$

Add 489 to 13203.

(Total for Question 8 is 2 marks)

9 (a) Simplify  $6p + 2t + p - 3t$

$$\begin{aligned} 6p + p + 2t - 3t \\ 7p - t \quad (2) \end{aligned}$$

$$\begin{array}{r} 7p - t \\ \hline (2) \end{array}$$

$$A = 8x - 3y$$

(b) Work out the value of A when  $x = 5$  and  $y = 4$

$$\begin{aligned} A &= 8(5) - 3(4) \quad (1) \\ &= 40 - 12 \\ &= 28 \quad (1) \end{aligned}$$

$$A = \begin{array}{r} 28 \\ \hline (2) \end{array}$$

(Total for Question 9 is 4 marks)

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10

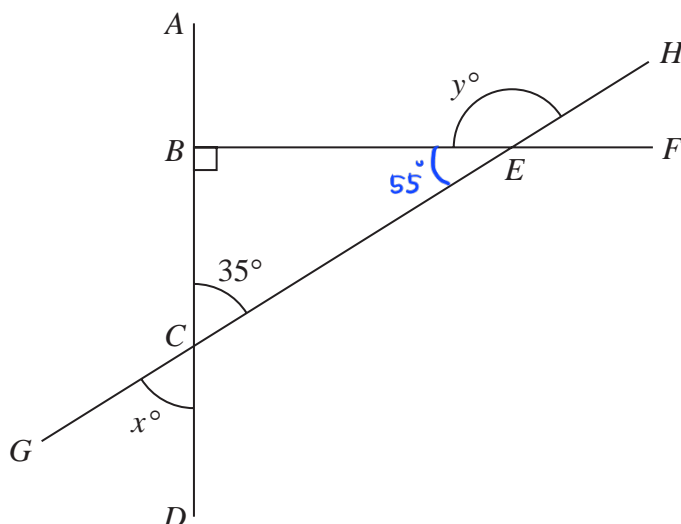


Diagram NOT accurately drawn

In the diagram,  $BCE$  is a right-angled triangle.  
 $ABCD$ ,  $BEF$  and  $GCEH$  are straight lines.

Angle  $BCE = 35^\circ$

(a) (i) Find the value of  $x$

$x^\circ = \text{angle } BCE = 35^\circ$  (1)

$x = \dots\dots\dots 35$   
 (1)

(ii) Give a reason for your answer.

Vertically opposite angles are equal. (1)

(1)

(b) (i) Work out the value of  $y$

$\text{angle } BEC = 180^\circ - 35^\circ - 90^\circ$   
 $= 55^\circ$  (1)

$y^\circ = 180^\circ - 55^\circ$   
 $= 125^\circ$  (1)

$y = \dots\dots\dots 125$   
 (2)

(ii) Give a reason for your answer.

Angles in a triangle add up to  $180^\circ$ . Angles on a straight line add up to  $180^\circ$ . (1)

(1)

(Total for Question 10 is 5 marks)

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11 Sophia spends a total of £6.30 on cheese.

She buys 500 g of Cheddar cheese and 200 g of Stilton cheese.

The cost of the Cheddar cheese is £9.20 for 1 kg.

Work out the cost of 1 kg of the Stilton cheese.

Cost of 500 g of cheddar cheese:

$$9.20 \times \frac{0.5}{1} = 4.60 \quad (1)$$

Cost of 200 g of Stilton cheese:

$$6.30 - 4.60 = 1.70 \quad (1)$$

Cost of 1 kg of stilton cheese:

$$1.70 \times \frac{1 \text{ kg}}{0.2 \text{ kg}} = 8.50 \quad (1)$$

£..... 8.50

(Total for Question 11 is 4 marks)

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12 The diagram below shows the trapezium  $PQRS$

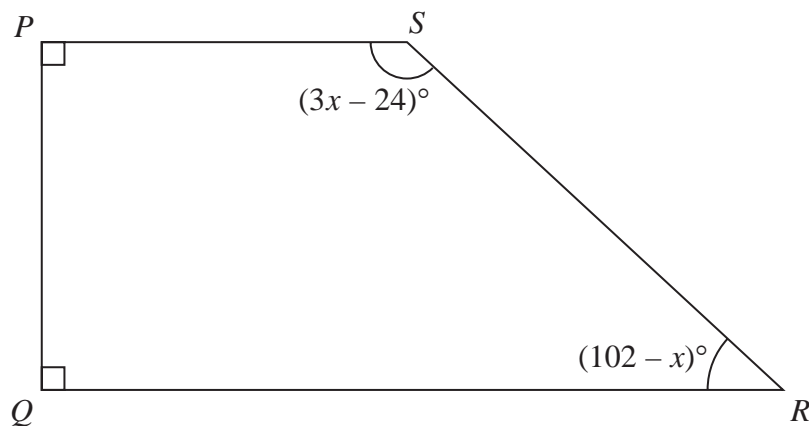


Diagram **NOT** accurately drawn

Angle  $PQR$  and angle  $QPS$  are right angles.

Find the value of  $x$

Angles in a quadrilateral adds up to  $360^\circ$  :

$$90 + 90 + (3x - 24) + (102 - x) = 360 \quad (1)$$

$$180 + 2x + 78 = 360$$

$$2x = 360 - 180 - 78 \quad (1)$$

$$2x = 102$$

$$x = 51 \quad (1)$$

$$x = \dots\dots\dots 51$$

(Total for Question 12 is 3 marks)



- 13 Salma asked some people what type of exercise they each liked the best from walking or running or swimming or cycling.

Salma is going to draw a pie chart for her results.

The incomplete table gives some information about her results.

Type of exercise	Number of people	Angle in pie chart
Walking	18	90°
Running	30	150°
Swimming		45°
Cycling	15	75°

18 people answered walking.

- (a) How many people answered running?

$$\text{Running} = \frac{150^\circ}{90^\circ} \times 18 \quad (1)$$

$$= 30 \quad (1)$$

30

(2)

15 people answered cycling.

- (b) How many people answered swimming?

Angles in pie chart of cycling :

$$\theta = \frac{15}{30} \times 150^\circ = 75^\circ$$

Angles in pie chart of swimming :

$$360^\circ - 90^\circ - 150^\circ - 75^\circ = 45^\circ \quad (1)$$

9

(3)

$$\text{Swimming} : \frac{45^\circ}{90^\circ} \times 18 = 9 \quad (1)$$

(Total for Question 13 is 5 marks)

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14 Jakub has bought a chicken.

He is going to use this rule to work out the number of minutes it will take to cook his chicken.

**Cooking time (minutes)**

Multiply the chicken's weight, in kg, by 40  
Then add  
30

The weight of Jakub's chicken is 2.6 kg

(a) Use the rule to work out the number of minutes it will take to cook Jakub's chicken.

$$\begin{aligned} \text{Cooking time} &= (2.6 \text{ kg} \times 40) + 30 \quad (1) \\ &= 104 + 30 \\ &= 134 \quad (1) \end{aligned}$$

..... 134 ..... minutes  
(2)

The following week Jakub buys another chicken.

He uses the rule and works out that it will take 2 hours 40 minutes to cook this chicken.

(b) Work out the weight of this chicken.

1 hour = 60 minutes

$$\begin{aligned} 2 \text{ hours } 40 \text{ minutes} &= (2 \times 60) + 40 \\ &= 160 \text{ minutes} \quad (1) \end{aligned}$$

$$160 = (\text{weight} \times 40) + 30$$

$$\text{weight} = \frac{160 - 30}{40} = 3.25 \text{ kg} \quad (3)$$

..... 3.25 ..... kg

(Total for Question 14 is 5 marks)



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15 Bella and Millie share some money in the ratio 5:2

Bella receives 10.50 euros more than Millie.

Work out the total amount of money they share.

$$\text{Total ratio} = 7$$

$$\text{Difference in ratio} = 3$$

$$\frac{10.50}{3} = 3.50 \quad (1)$$

$$\begin{aligned} \text{Total amount they share} &= 3.50 \times 7 \quad (1) \\ &= 24.50 \quad (1) \end{aligned}$$

24.50

..... euros

(Total for Question 15 is 3 marks)

16 Work out the value of

$$\frac{15.2 \times 4.1}{8 - \sqrt{3.7}}$$

Write down all the figures on your calculator display.

$$\begin{array}{r} 62.32 \\ \hline 6.076461594 \end{array} \quad (1)$$

$$= 10.25596871 \quad (1)$$

10.25596871

(Total for Question 16 is 2 marks)

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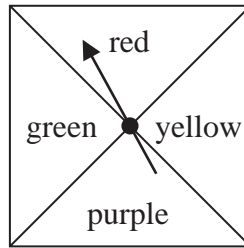
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17 Here is a biased spinner.



When the spinner is spun once, the probabilities that it lands on red or on yellow or on green are given in the table.

<b>Colour</b>	red	yellow	purple	green
<b>Probability</b>	0.25	0.2	0.35	0.2

(a) Work out the probability that the spinner lands on red or on yellow.

$$P(R) + P(Y) = 0.25 + 0.2$$

$$= 0.45 \quad (1)$$

0.45

(1)

Yang is going to spin the spinner 300 times.

(b) Work out an estimate for the number of times the spinner will land on purple.

$$1 - (0.25 + 0.2 + 0.2) \quad (1)$$

$$= 0.35$$

$$0.35 \times 300 = 105 \quad (1)$$

105

(3)

(Total for Question 17 is 4 marks)



18 In a warehouse there are two types of shelves, type **R** and type **S**.

These two types of shelves are arranged into shelving units that form a sequence of patterns.

Here are the first three terms in the sequence.

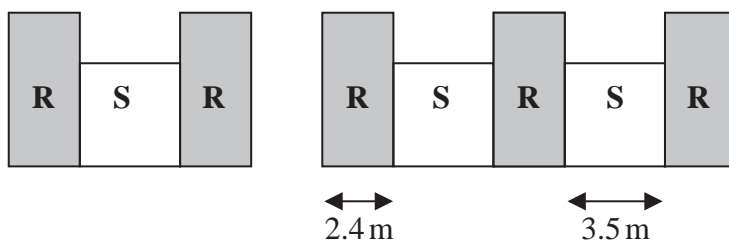
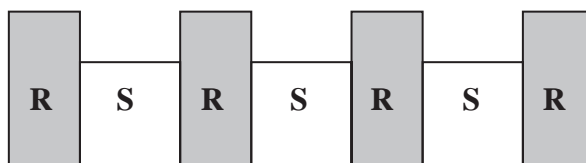


Diagram **NOT** accurately drawn

$2R + 1S$



The width of each type **R** shelf is 2.4 m and the width of each type **S** shelf is 3.5 m

(a) Work out the total width of a shelving unit that has 6 type **R** shelves.

[ 6 R shelves + 5 S shelves ]

$= 6 \times R + 5 \times S$

$= (6 \times 2.4) + (5 \times 3.5)$  ①

$= 14.4 + 17.5$

$= 31.9$  ①

$31.9$   
..... m  
(2)

A shelving unit has  $n$  type **R** shelves.  
The total width of this shelving unit is  $W$  metres.

(b) Find an expression for  $W$  in terms of  $n$   
Give your answer in its simplest form.

$T_1 = 2R + S$

$T_2 = 3R + 2S$

$T_n = nR + (n-1)S$

$W = n(2.4) + (n-1)(3.5)$

$= 2.4n + 3.5n - 3.5$  ①

$W = 5.9n - 3.5$  ①

$W = 5.9n - 3.5$   
.....  
(2)

(Total for Question 18 is 4 marks)

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19 Here are five cards.

Each card has a number written on it.

15

7

-2

23

 $x$ 

The mean of the five numbers is 12

Work out the value of  $x$

$$\text{Mean} = \frac{15 + 7 + (-2) + (23) + x}{5} = 12 \quad (1)$$

$$43 + x = 12(5) \quad (1)$$

$$x = 60 - 43$$

$$= 17 \quad (1)$$

$$x = \dots\dots\dots 17$$

(Total for Question 19 is 3 marks)

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- 20 The language department of a college has 180 students.  
Each student studies exactly one of French, German, Italian or Spanish.

15 students study French.

45% of the students study German.

Express the percentage of students studying Italian or Spanish as a percentage of those studying French or German.

$$\% \text{ studying French} = \frac{15}{180} \times 100\% = 8.33\% \quad (1)$$

$$\text{German} = 45\%$$

% of student studying French and German:

$$45\% + 8.33\% = 53.33\%$$

% of student studying Italian or Spanish:

$$100\% - 53.33\% = 46.67\% \quad (1)$$

$$\frac{46.67\%}{53.33\%} \times 100\% = 87.5\% \quad (1)$$

87.5 %

(Total for Question 20 is 4 marks)

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21 (a) Expand  $3c^3(c+4)$

$$3c^4 + 12c^3$$

$$3c^4 + 12c^3 \quad (2)$$

(2)

(b) (i) Factorise  $x^2 + 8x - 9$

$$x^2 + 8x - 9$$

$$(x-1)(x+9)$$

$$(x-1)(x+9) \quad (2)$$

(2)

(ii) Hence, solve  $x^2 + 8x - 9 = 0$

$$(x-1)(x+9)$$

$$x=1 \text{ or } x=-9$$

$$1, -9 \quad (1)$$

(1)

(Total for Question 21 is 5 marks)



22 Show that  $2\frac{2}{3} + 3\frac{3}{4} = 6\frac{5}{12}$

$$\begin{array}{l} \rightarrow b \\ a/c \\ \leftarrow x \\ \times \end{array} = \frac{cx+ab}{c}$$

$$\text{LHS} : \frac{8 \times 4}{3 \times 4} + \frac{15 \times 3}{4 \times 3} \quad (1)$$

$$= \frac{32}{12} + \frac{45}{12} \quad (1)$$

$$= \frac{77}{12} \quad (1)$$

$$= 6\frac{5}{12} \quad (\text{shown})$$

$$\begin{array}{r} 6 \\ 12 \overline{) 77} \\ \underline{- 72} \\ 5 \end{array}$$

(Total for Question 22 is 3 marks)

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23 The diagram shows a solid cylinder made from iron.

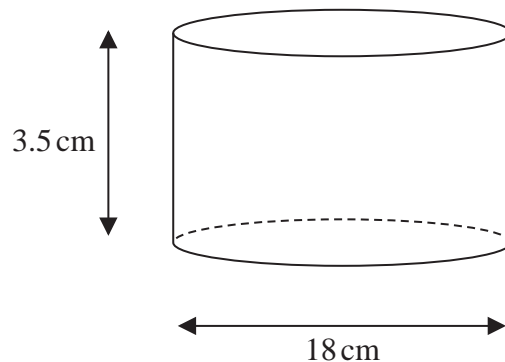


Diagram NOT accurately drawn

The cylinder has diameter 18 cm and height 3.5 cm  
The mass of the cylinder is 7.04 kg

Work out the density of the iron.  
Give your answer in  $\text{g/cm}^3$  correct to 2 significant figures.

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

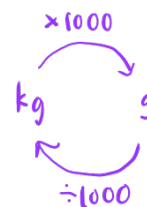
$$\pi \times r^2 \times h$$

$$\text{Volume of cylinder} = \pi \times \left(\frac{18}{2}\right)^2 \times 3.5$$

$$= 890.64 \dots \text{ (1)}$$

$$\text{density} = \frac{7.04 \times 1000}{890.64 \dots} \quad \text{- convert to g} \quad \text{(1)}$$

$$= 7.9 \text{ g/cm}^3 \quad \text{(1)}$$



..... 7.9 .....  $\text{g/cm}^3$

(Total for Question 23 is 3 marks)



- 24 Jane bought a new car for \$18000  
The car depreciates in value by 15% each year.

Work out the value of the car at the end of 4 years.  
Give your answer correct to the nearest \$

$$\begin{aligned} \text{Value each year: } & (100\% - 15\%) \text{ of value} \\ & = 85\% \end{aligned}$$

$$\begin{aligned} \text{Value at the end of 4 years: } & 18\,000 \times \left(\frac{85}{100}\right)^4 \quad (2) \\ & = 9396 \quad (1) \end{aligned}$$

\$.....9396

(Total for Question 24 is 3 marks)

- 25 Solve the inequality  $3 - 4x \leq 11$

$$3 - 4x \leq 11$$

$$3 - 11 \leq 4x$$

$$-8 \leq 4x \quad (1)$$

$$\frac{-8}{4} \leq x$$

$$-2 \leq x \quad (1)$$

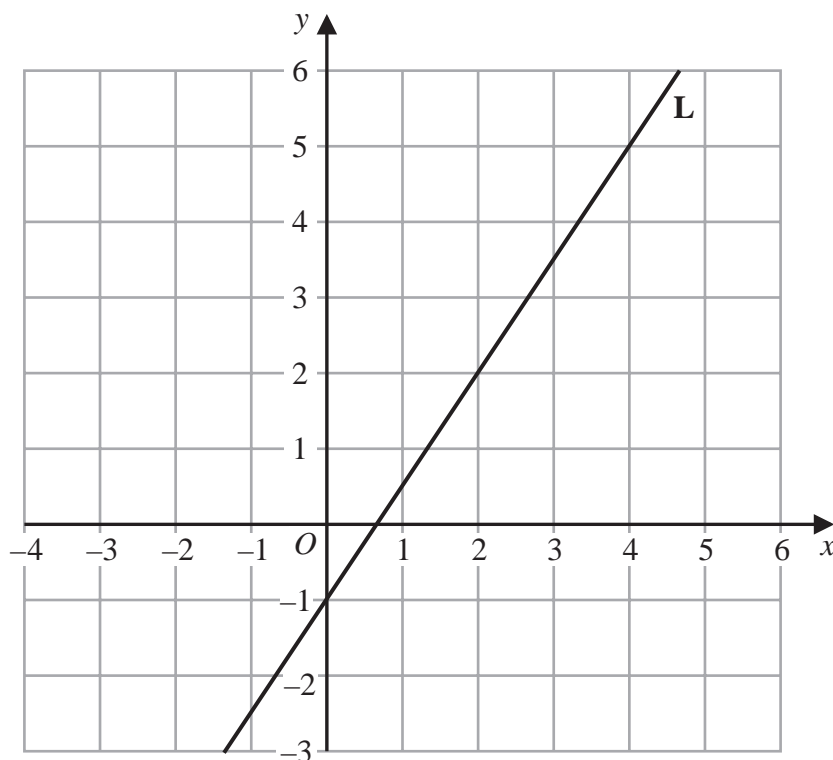
$$x \geq -2$$

(Total for Question 25 is 2 marks)





26 Line **L** is drawn on the grid.



Find an equation for **L**

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

$$c = y\text{-intercept} = -1 \quad (1)$$

$$\text{gradient} : \frac{5 - (-1)}{4 - 0}$$

$$= \frac{6}{4} = \frac{3}{2} \quad (1)$$

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

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

(Total for Question 26 is 3 marks)



27 The diagram shows a quadrilateral  $ABCD$

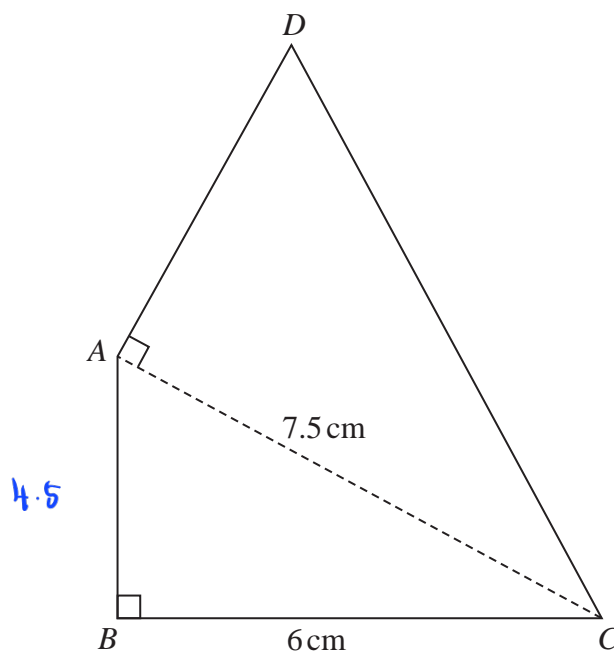


Diagram NOT  
accurately drawn

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In the diagram,  $ABC$  and  $DAC$  are right-angled triangles.

$$BC = 6 \text{ cm} \quad AC = 7.5 \text{ cm}$$

The area of quadrilateral  $ABCD$  is  $31.5 \text{ cm}^2$

Work out the length of  $AD$

By using Pythagoras' theorem:

$$\text{length } AB = \sqrt{7.5^2 - 6^2} \quad (1)$$

$$= 4.5 \text{ cm} \quad (1)$$

$$\text{Area of triangle } ABC : \frac{1}{2} \times 6 \times 4.5 = 13.5 \text{ cm}^2 \quad (1)$$

$$\text{Area of triangle } ADC : 31.5 - 13.5 = 18 \text{ cm}^2 \quad (1)$$

$$\frac{1}{2} \times AD \times 7.5 = 18$$

$$AD = \frac{18}{7.5} \times 2 \quad (1)$$

$$= 4.8 \text{ cm} \quad (1)$$



Question 27 continued.

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.....4.8..... cm

(Total for Question 27 is 6 marks)

**TOTAL FOR PAPER IS 100 MARKS**



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