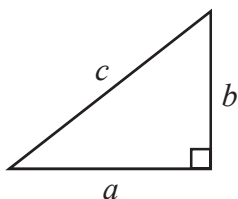


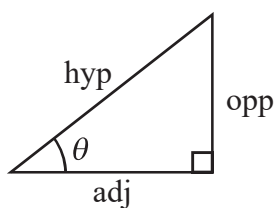
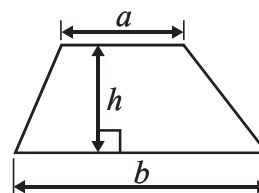
## International GCSE MATHEMATICS

### FORMULAE SHEET – FOUNDATION TIER

Pythagoras' Theorem  
 $a^2 + b^2 = c^2$

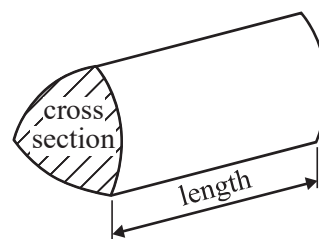


Area of a trapezium =  $\frac{1}{2}(a + b)h$



$$\begin{aligned} \text{adj} &= \text{hyp} \times \cos \theta \\ \text{opp} &= \text{hyp} \times \sin \theta \\ \text{opp} &= \text{adj} \times \tan \theta \end{aligned}$$

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



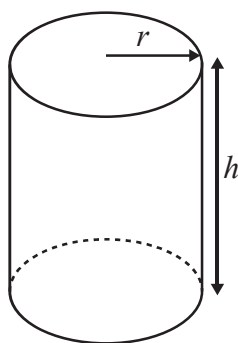
$$\text{or } \sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

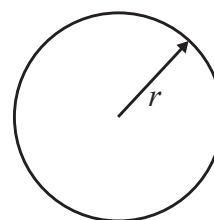
Circumference of circle =  $2\pi r$

Area of circle =  $\pi r^2$



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

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

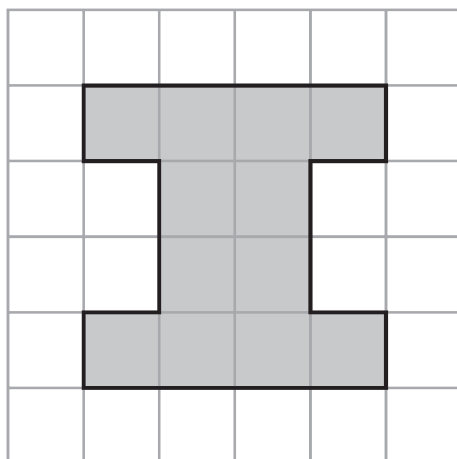


**Answer ALL TWENTY questions.**

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

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

1 The diagram shows a shape on a centimetre grid.



(a) On the grid, draw all the lines of symmetry of the shape.

(2)

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

.....  
(1)

(c) Find the area of the shape.

..... cm<sup>2</sup>  
(1)

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



- 2 (a) Write down the whole number which is equal to  
 $(5 \times 1000) + (7 \times 100) + (3 \times 10) + 4$

.....  
 (1)

- (b) Write down the decimal number which is equal to

$$\left(8 \times \frac{1}{10}\right) + \left(9 \times \frac{1}{100}\right) + \left(6 \times \frac{1}{1000}\right)$$

.....  
 (1)

- (c) Add the numbers

sixty four thousand seven hundred  
 and  
 five thousand four hundred and ten.

- (i) Write your answer in figures.

- .....  
 (ii) Write your answer to (i) in words.

.....  
 (3)

**(Total for Question 2 is 5 marks)**



3 (a) Find all the factors of 45

.....  
(2)

(b) A common factor of 42 and 45 is 1  
Find the other common factor of 42 and 45

.....  
(1)

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

4 Here are the first four terms of a number sequence.

2      5      8      11

(a) Find the 5th term of the sequence.

.....  
(1)

(b) Explain how you found your term.

.....  
(1)

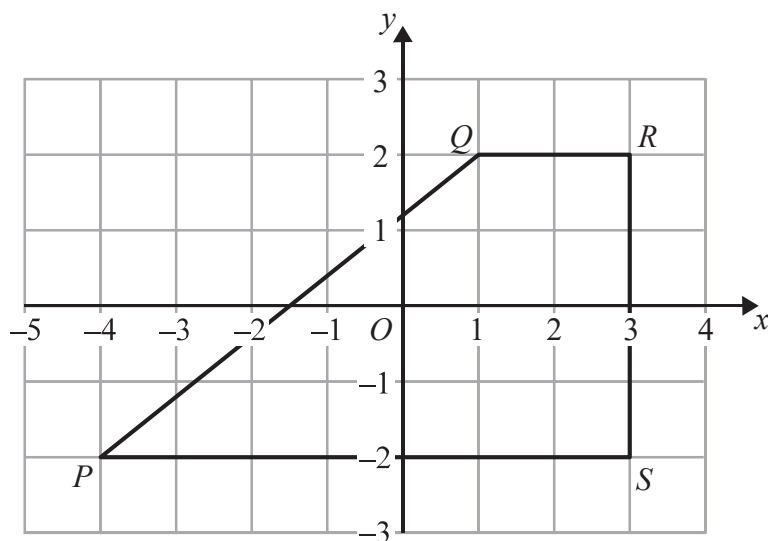
(c) Work out the difference between the 17th term and the 19th term of the sequence.

.....  
(2)

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



5 The diagram shows a quadrilateral  $PQRS$  on a centimetre grid.



(a) Write down the coordinates of  $R$ .

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

(b) Write down the coordinates of  $P$ .

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

(c) What is the mathematical name of the quadrilateral  $PQRS$ ?

.....  
(1)

(d) Measure the length of the side  $PQ$ .  
Give your answer in centimetres to 1 decimal place.

..... cm  
(1)

(e) Find the perimeter of the quadrilateral  $PQRS$ .  
Give your answer in centimetres to 1 decimal place.

..... cm  
(2)



(f) Work out the area of the quadrilateral  $PQRS$ .

..... cm<sup>2</sup>

(2)

**(Total for Question 5 is 8 marks)**

6 (a) Find the value of  $\frac{12 + 8}{6 - 2}$

.....  
(2)

(b) Find the value of  $(0.045 + 2.655) \times 0.03$

.....  
(2)

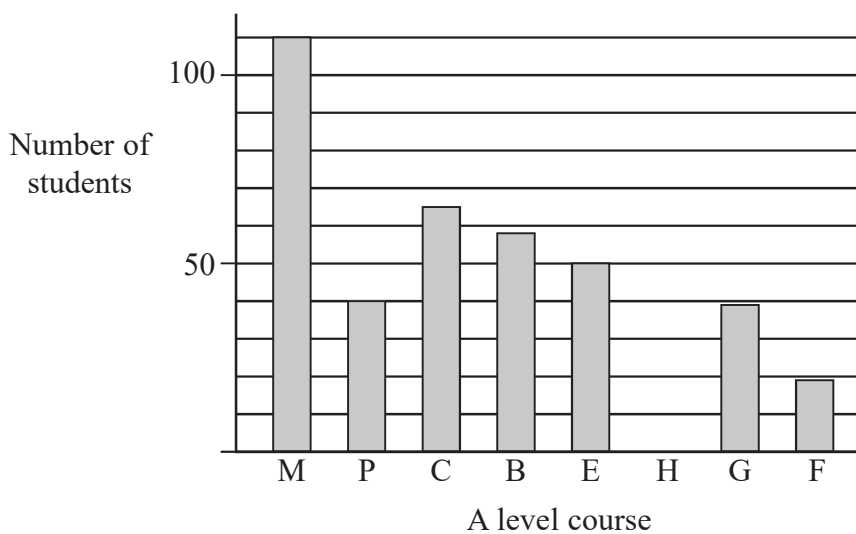
(c) Find the value of  $\sqrt[3]{42.875}$

.....  
(1)

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



- 7 The bar chart shows some information about the numbers of students who completed A level courses at Elm Tree Grammar School in 2012.



KEY	
<b>M</b>	Mathematics
<b>P</b>	Physics
<b>C</b>	Chemistry
<b>B</b>	Biology
<b>E</b>	English
<b>H</b>	History
<b>G</b>	Geography
<b>F</b>	French

- (a) How many students completed an A level course in Mathematics?

.....  
(1)

- (b) Which A level course was completed by exactly 50 students?

.....  
(1)

60 students completed an A level course in History.

- (c) Show this information on the bar chart.

(1)

There was a total of 800 A level examinations taken at the school in 2012.  
An A\* grade was achieved in 23% of these.

- (d) Find 23% of 800

.....  
(2)



An A grade was achieved in 304 of the A level examinations.

(e) Express 304 as a percentage of 800

.....%

(2)

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

8 The diagram shows a prism made from centimetre cubes.

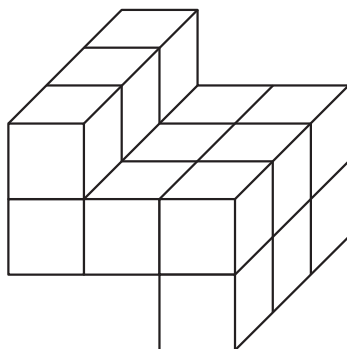


Diagram **NOT**  
accurately drawn

Find the volume of the prism.  
Give the units of your answer.

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





9 Three rectangular cards are numbered 1, 3 and 5



Sanjay takes at random one of these cards.

(a) Find the probability that the number on the card he takes is

(i) 5

(ii) an even number.

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

Three circular cards are numbered 2, 3 and 4



Shondra takes at random one of these circular cards.

(b) Find the probability that the number on the card she takes is an even number.

.....  
(1)



Amrit has all six cards.

She takes at random one rectangular card and one circular card.

She adds together the numbers on the two cards to find the total for these two cards.

(c) Complete the table to show all possible totals.

Three totals have been done for you.

		Number on rectangular card		
		1	3	5
Number on circular card	2	3		
	3			8
	4	5		

(2)

(d) Work out the probability that the total is

(i) 8

(ii) 5 or 7

(2)

**(Total for Question 9 is 7 marks)**

**Do NOT write in this space.**



10

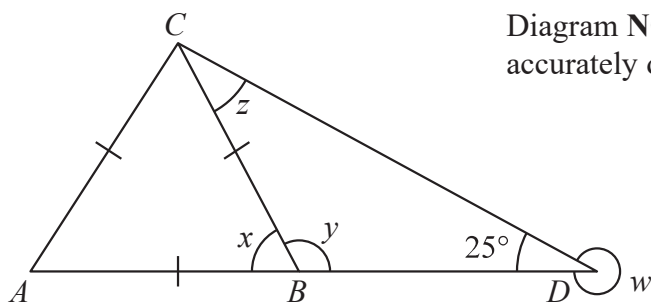


Diagram NOT accurately drawn

In the diagram,  $ABD$  is a straight line.  
 $AB = BC = CA$  and angle  $BDC = 25^\circ$

(a) Work out the size of angle  $w$ .

.....  
 (1)

(b) Write down the size of angle  $x$ .

.....  
 (1)

(c) Work out the size of angle  $y$ .

.....  
 (1)

(d) Work out the size of angle  $z$ .

.....  
 (2)

(Total for Question 10 is 5 marks)



11 (a) Write  $\frac{36}{150}$  as a fraction in its simplest form.

.....  
(1)

(b) Write  $\frac{48}{150}$  as a decimal number.

.....  
(2)

(c) Write a number in the box so that the calculation is correct.

$$\frac{72}{90} \times \frac{1}{6} = \frac{\boxed{\phantom{000}}}{30}$$

(2)

(Total for Question 11 is 5 marks)



12 (a) Solve  $x - 7 = 11$

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

(1)

(b) Solve  $5y + 4 = 39$

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

(2)

(c) Solve  $3(2z - 5) = 4z + 11$   
Show clear algebraic working.

$$z = \dots\dots\dots$$

(3)

---

**(Total for Question 12 is 6 marks)**

---

**Do NOT write in this space.**



**13** The water in a fish tank is treated by using 5 millilitres of AquaGuard for every 10 litres of water in the tank.

- (a) Write down the ratio of the volume of AquaGuard used to the volume of water in the tank.  
Give your answer in the form  $1 : n$

1 : .....  
(2)

A tank contains 96 litres of water.

- (b) Work out the volume of AquaGuard that should be used.  
Give your answer in millilitres.

..... millilitres  
(2)

**(Total for Question 13 is 4 marks)**

**Do NOT write in this space.**



14 (a) Simplify  $2a - 5b + 3a - 4b + a$

.....  
(2)

(b) Factorise  $7dg - 9de$

.....  
(2)

(c) Expand and simplify  $(x + 2)(x + 5)$

.....  
(2)

**(Total for Question 14 is 6 marks)**

---

**Do NOT write in this space.**



- 15 The diagram shows a rectangle  $PQRS$ .  
 $PQ = 14$  cm and  $QR = 9$  cm.  
 The point  $A$  lies on  $PS$  so that  $PA = 5$  cm.  
 The point  $B$  lies on  $SR$  so that  $BR = 8$  cm.

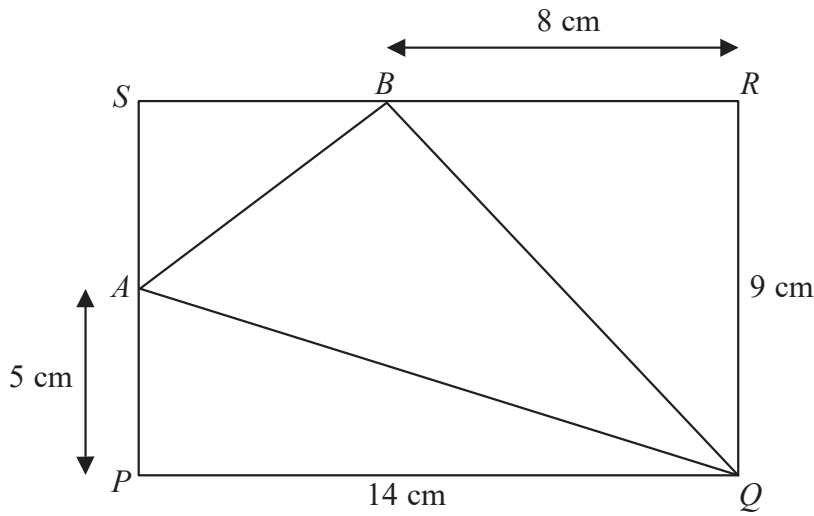


Diagram **NOT** accurately drawn

- (a) Work out the area of triangle  $AQB$ .

..... cm<sup>2</sup>  
 (4)

- (b) Work out the length of  $AQ$ .  
 Give your answer correct to 3 significant figures.

..... cm  
 (3)

(Total for Question 15 is 7 marks)





16 Freya keeps hens.

The table shows information about the number of boxes of eggs she sold in each of 52 weeks.

Number of boxes sold in a week	Number of weeks
0 to 4	2
5 to 9	6
10 to 14	20
15 to 19	13
20 to 24	8
25 to 29	3

(a) Write down the modal class.

.....  
(1)

(b) Work out an estimate for the mean number of boxes of eggs that Freya sold each week.  
Give your answer correct to 3 significant figures.

.....  
(4)



Dan picks at random one of the 52 weeks.

(c) Find the probability that in this week Freya sold at least 15 boxes of eggs.

.....  
(2)

**(Total for Question 16 is 7 marks)**

17 The table gives some information about the average price of a litre of petrol in England.

	January 2007	January 2012
Average price of a litre of petrol (pence)	87.3	133.3

Work out the percentage increase in the average price of a litre of petrol in England between January 2007 and January 2012.

Give your answer correct to 3 significant figures.

..... %

**(Total for Question 17 is 3 marks)**



18  $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

$$A = \{1, 3, 5, 7\}$$

$$B = \{2, 4, 6, 8\}$$

(a) Explain why  $A \cap B = \emptyset$

(1)

$$x \in \mathcal{E} \text{ and } x \notin A \cup B$$

(b) Write down the value of  $x$ .

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

(1)

$$A \cap C = \{3, 7\}, B \cap C = \{8\} \text{ and } A \cup B \cup C = \mathcal{E}$$

(c) List all the members of  $C$ .

(2)

(Total for Question 18 is 4 marks)



19 A cylinder has diameter 12 cm and length 30 cm.

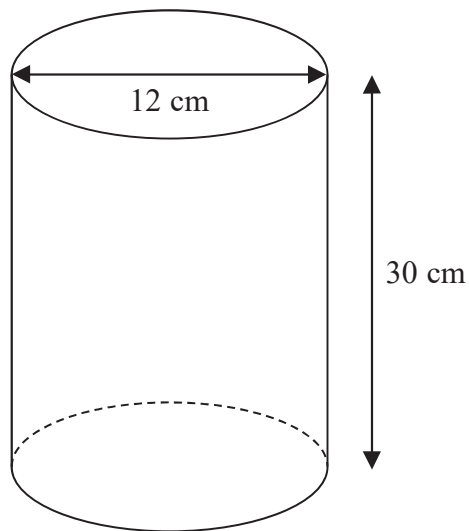


Diagram **NOT**  
accurately drawn

Work out the curved surface area of the cylinder.  
Give your answer correct to 3 significant figures.

..... cm<sup>2</sup>

(Total for Question 19 is 3 marks)



P 4 3 0 7 2 A 0 2 1 2 4

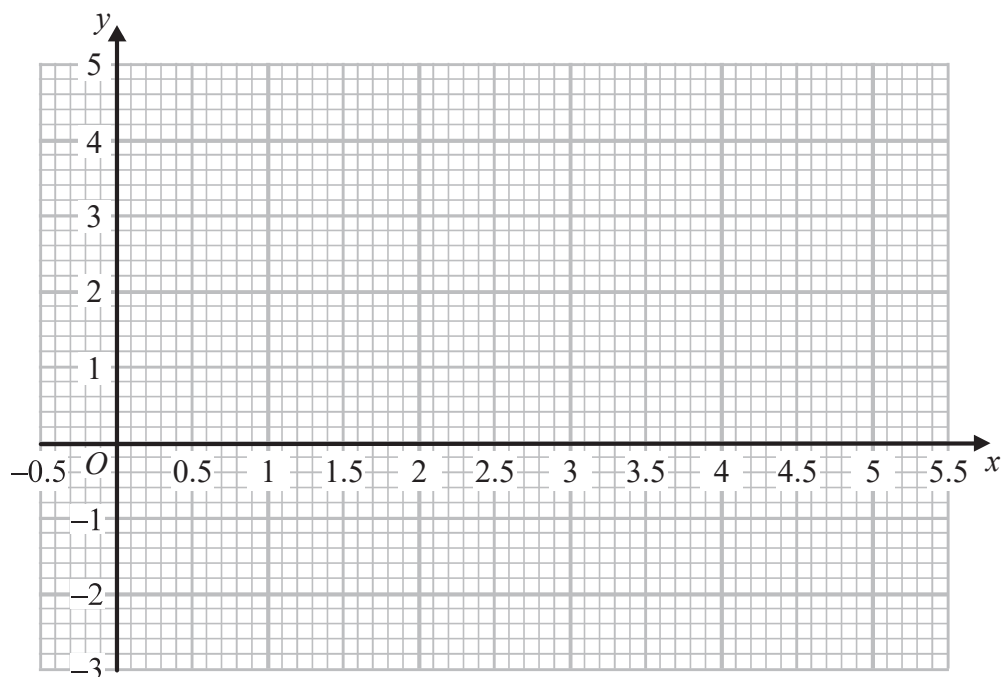
20 (a) Complete the table of values for  $y = x^2 - 5x + 4$

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

(2)

(b) On the grid, draw the graph of  $y = x^2 - 5x + 4$  for all values of  $x$  from  $x = 0$  to  $x = 5$

(2)



(Total for Question 20 is 4 marks)

**TOTAL FOR PAPER IS 100 MARKS**

**Do NOT write in this space.**

