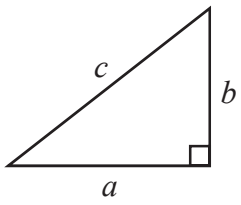
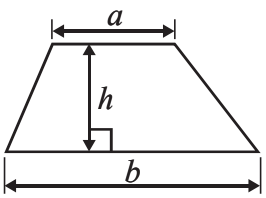
International GCSE MATHEMATICS

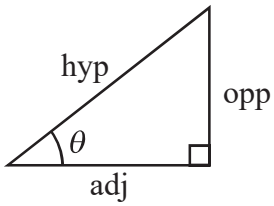
FORMULAE SHEET – FOUNDATION TIER

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



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





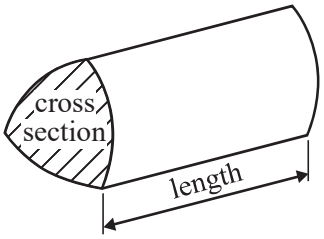
adj = hyp × cos θ
opp = hyp × sin θ
opp = adj × tan θ

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

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

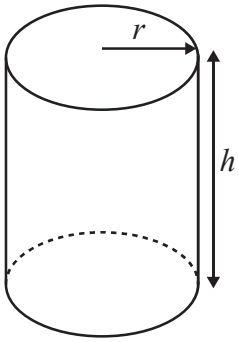
$\tan\theta = \frac{\text{opp}}{\text{adj}}$

Volume of prism = area of cross section × length



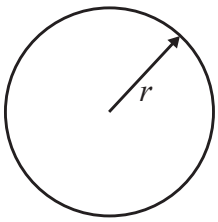
Circumference of circle = $2\pi r$

Area of circle = πr^2



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

Curved surface area of cylinder = $2\pi rh$

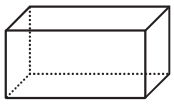


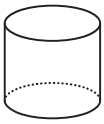
Answer ALL EIGHTEEN questions.

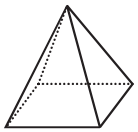
Write your answers in the spaces provided.

You must write down all the stages in your working.

1 (a) Write down the mathematical name for each of these 3-D shapes.

(i) 

(ii) 

(iii) 

(i) ..... (ii) ..... (iii) .....

(3)

Here is a solid prism made from centimetre cubes.

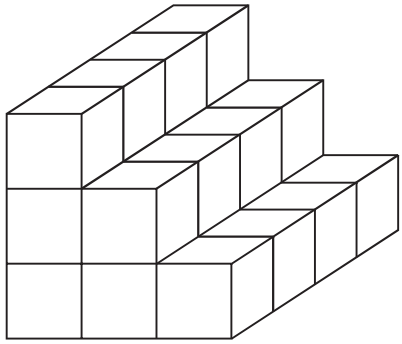


Diagram **NOT** accurately drawn

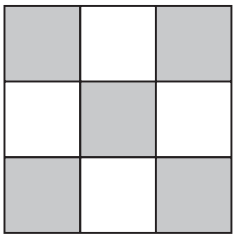
(b) Work out the volume of the prism.

..... cm^3

(2)

(Total for Question 1 is 5 marks)

2 (a) What fraction of this shape is shaded?



.....

(1)

(b) Shade 25% of this shape.

(1)

(c) Write $\frac{18}{20}$ as a decimal.

.....

(1)

(d) Write $\frac{3}{25}$ as a percentage.

.....%

(2)

(Total for Question 2 is 5 marks)

3 (a) Write down two whole numbers, both greater than 1, that multiply to give 63

..... × ..... = 63

(1)

(b) Write down the number between 50 and 60 that is a multiple of 11

.....

(1)

(c) Write down the square number that is between 35 and 45

.....

(1)

(d) Write down the prime number that is between 48 and 58

.....

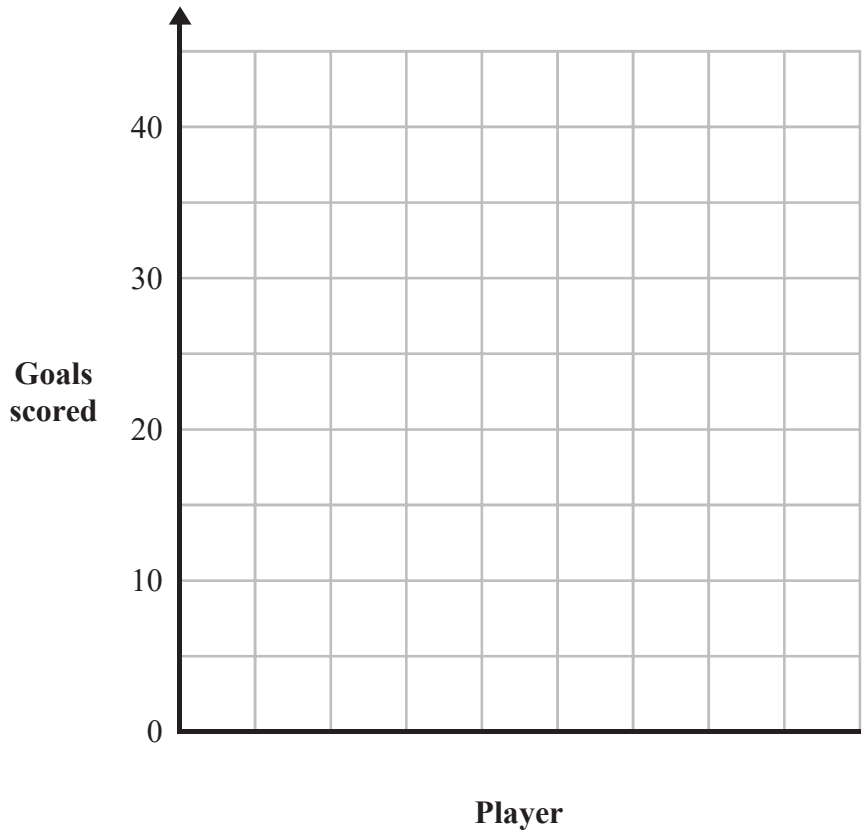
(1)

(Total for Question 3 is 4 marks)

4 The table shows the number of goals scored for a football team by each of four players during part of a football season.

Player	Goals scored
Ben	20
Dale	15
Matt	5
Ronald	35

(a) On the grid, draw a bar chart to show this information.



(3)

(b) Work out the mean of the numbers of goals scored by these players.

.....

(2)

(c) Work out the range of the numbers of goals scored by these players.

.....

(2)

(d) Write down the ratio of the number of goals scored by Ronald to the number of goals scored by Dale.
Give your answer in its simplest form.

.....

(2)

(Total for Question 4 is 9 marks)

5 (a) Write 4.513 correct to one decimal place.

.....

(1)

(b) Write 8479 correct to the nearest ten.

.....

(1)

(c) By rounding each number to one significant figure, estimate the value of

$$\frac{9.64 \times 21.3}{37}$$

Show your working clearly.

.....

(2)

(Total for Question 5 is 4 marks)

6 Here are the first five terms of a number sequence.

6 12 18 24 30

(a) Write down the 6th term of the sequence.

.....

(1)

186 is a term of the sequence.

(b) Write down the next term of the sequence after 186

.....

(1)

(c) Find the 20th term of the sequence.

.....

(2)

The nth term of the sequence is T.

(d) Write down a formula for T in terms of n.

.....

(2)

(Total for Question 6 is 6 marks)

7 The table shows the boiling points and the melting points of five elements.

	Boiling point (°C)	Melting point (°C)
Bromine	59	–7
Chlorine	–34	–101
Mercury	357	–39
Nitrogen	–196	–210
Oxygen	–183	–218

(a) Which of these elements has the lowest boiling point?

.....

(1)

(b) What is the difference in temperature between the boiling point of chlorine and the boiling point of oxygen?

..... °C

(2)

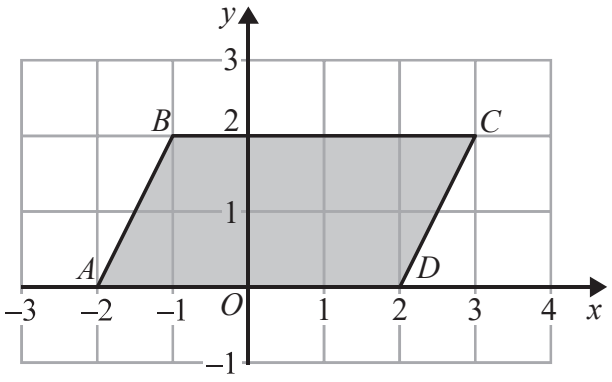
(c) What is the difference in temperature between the melting point of mercury and the boiling point of mercury?

..... °C

(2)

(Total for Question 7 is 5 marks)

8 The diagram shows a quadrilateral *ABCD* on a centimetre grid.



(a) Write down the coordinates of

(i) *C*

(..... , ...)

(ii) *B*

(..... , ...)

(2)

(b) Write down the mathematical name for the quadrilateral *ABCD*

.....

(1)

(c) Write down the order of rotational symmetry of the quadrilateral *ABCD*

.....

(1)

(d) Work out the area of the quadrilateral *ABCD*

..... cm^2

(2)

(e) Find the coordinates of the midpoint of AC

(..... , ...)

(2)

(Total for Question 8 is 8 marks)

9 (a) Find the value of 9^4

.....

(1)

(b) Find the cube root of 6859

.....

(1)

(c) Work out the value of $\dfrac{21.89 - 7.75}{0.65 + 2.85}$

.....

(2)

(Total for Question 9 is 4 marks)

10

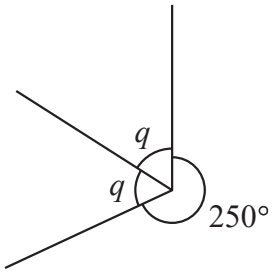


Diagram **NOT** accurately drawn

(a) Work out the size of angle q.

.....°

(2)

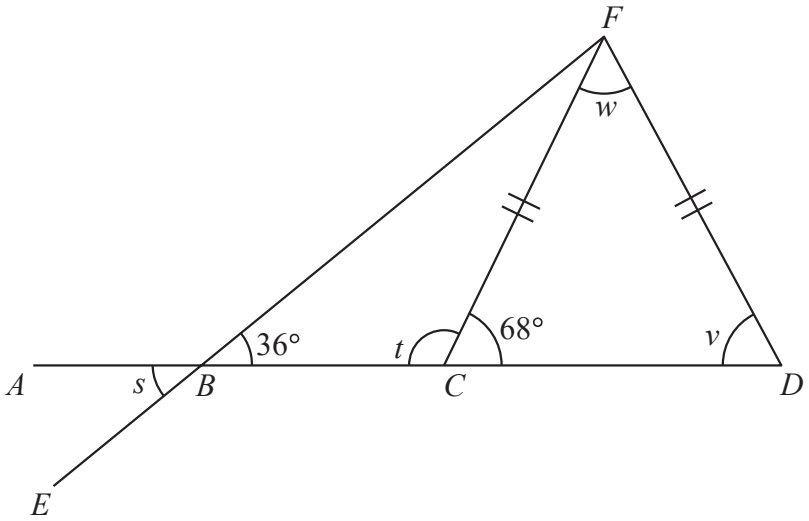


Diagram **NOT** accurately drawn

$ABCD$ and EBF are straight lines.
Angle $FBC = 36°$ and angle $FCD = 68°$
$FC = FD$

(b) Write down the size of angle s.

.....°

(1)

(c) Work out the size of angle t.

.....°

(1)

(d) Explain why angle $v = 68°$

.....

.....

(1)

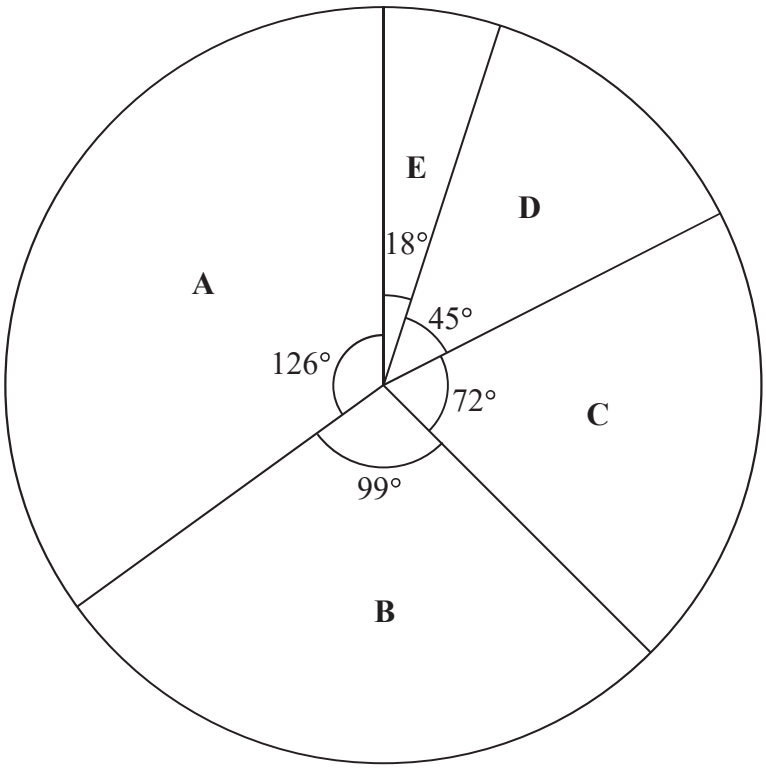
(e) Work out the size of angle w.

.....°

(2)

(Total for Question 10 is 7 marks)

11 The pie chart shows information about the grades achieved by all of the candidates in Keval's school who took AS Level English in 2015.



8 candidates achieved grade **C**.

(a) Work out the number of candidates in Keval's school who took AS Level English in 2015.

.....

(2)

(b) Work out the number of candidates in Keval's school who achieved grade **A** in AS Level English in 2015.

.....

(2)

(Total for Question 11 is 4 marks)

12 (a) Solve $x - 9 = 15$

$x =$ .....

(1)

(b) Solve $\frac{3}{4}y = 12$

$y =$ .....

(2)

(c) Factorise fully $18c - 27$

.....

(2)

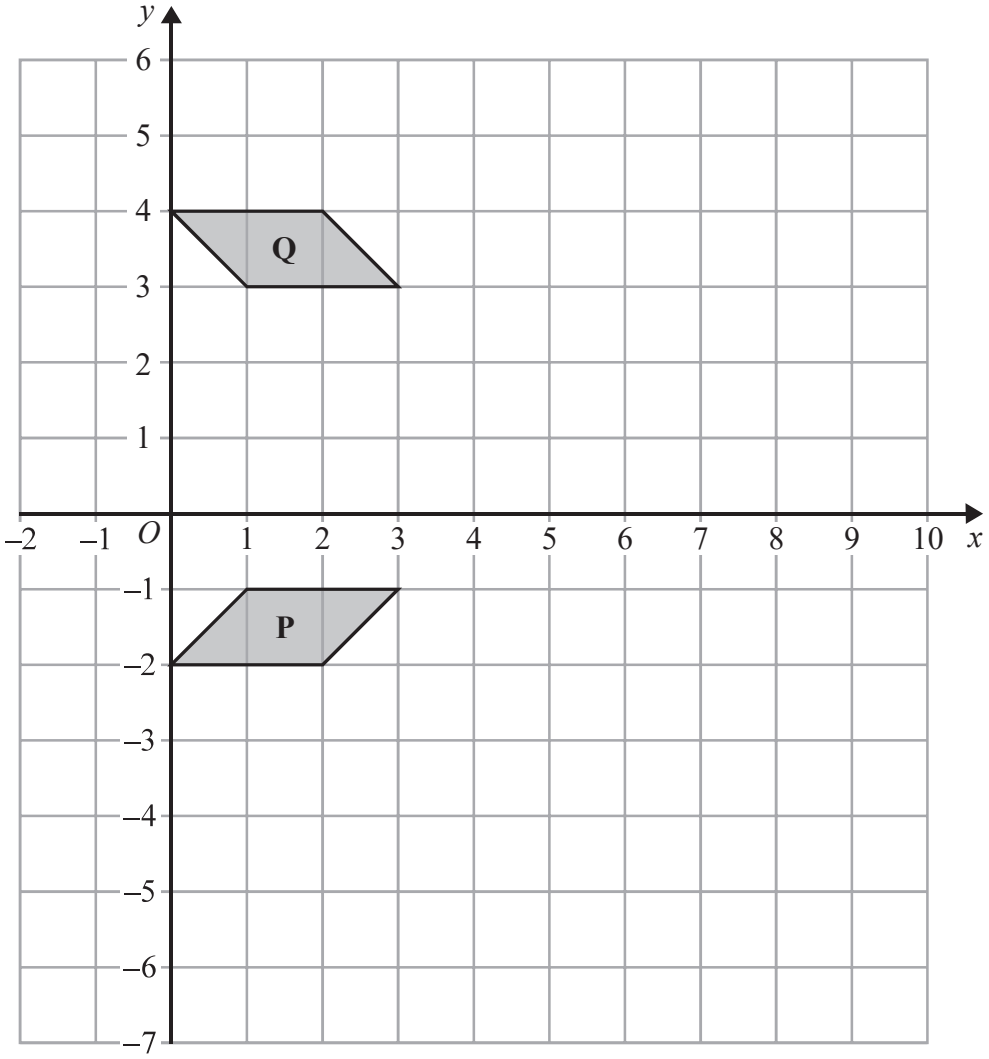
(d) Expand and simplify $(t - 4)(t + 5)$

.....

(2)

(Total for Question 12 is 7 marks)

13



(a) Describe fully the single transformation that maps shape **P** onto shape **Q**.

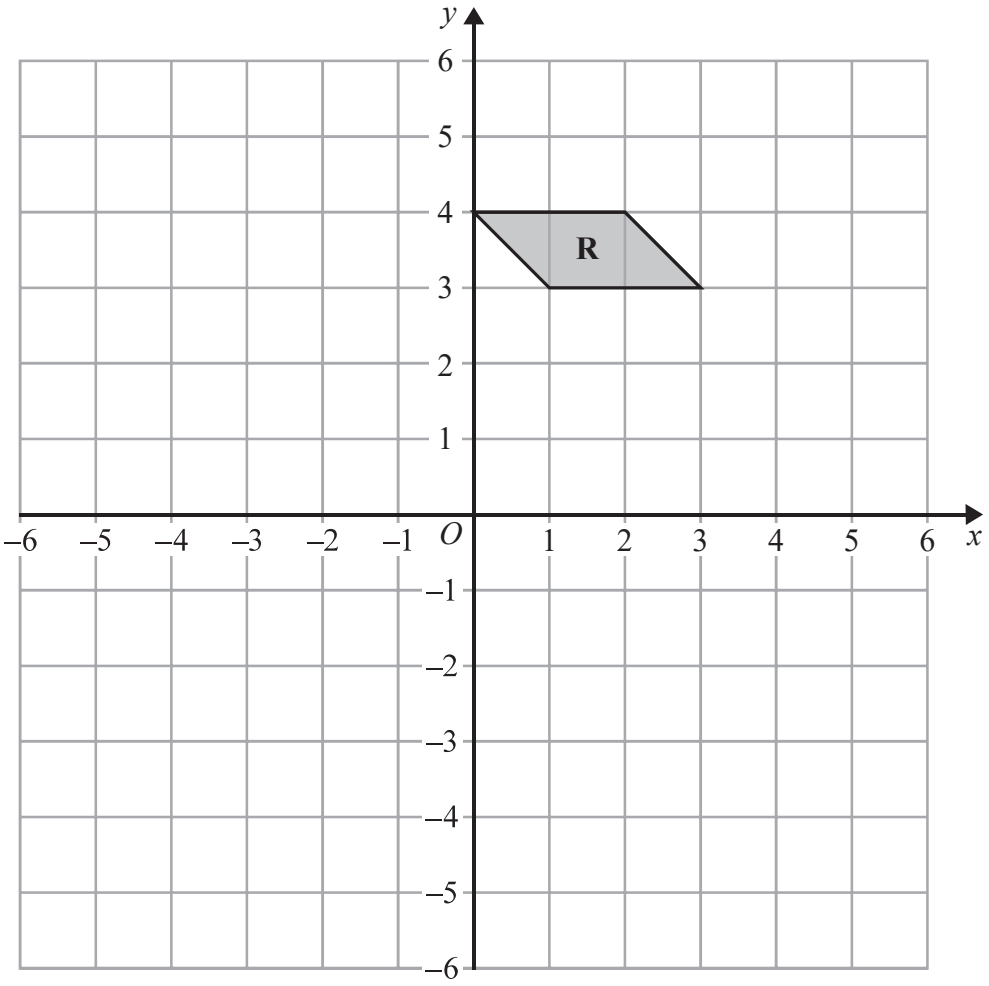
.....

.....

(2)

(b) On the grid above, enlarge shape **P** with scale factor 3 and centre *O*.

(2)



(c) On the grid above, rotate shape **R** 90° anticlockwise with centre (0, 1)

(2)

(Total for Question 13 is 6 marks)

14 In 1981, the population of India was 683 million.
Between 1981 and 1991, the population of India increased by 163 million.

(a) Express 163 million as a percentage of 683 million.
Give your answer correct to 3 significant figures.

.....%

(2)

In 2001, the population of India was 1028 million.
Between 2001 and 2011, the population of India increased by 17.6%

(b) Increase 1028 million by 17.6%
Give your answer to the nearest million.

..... million

(3)

(Total for Question 14 is 5 marks)

15 Maisie plays a game.
Each time she plays, she can win a prize of $1 or $5 or $10
When she does not win one of these prizes, she loses.
The table gives the probability of winning each of the prizes.

Prize	Probability
$1	0.50
$5	0.15
$10	0.05

Maisie plays the game once.

(a) Work out the probability that Maisie loses.

.....

(2)

(b) Maisie plays the game 40 times.

(i) Work out an estimate for the number of $5 prizes she wins.

.....

(2)

(ii) Work out an estimate for the total value of the prizes she wins.

$.....

(3)

(Total for Question 15 is 7 marks)

16 The diagram shows a circle with centre O and radius 6.5 cm

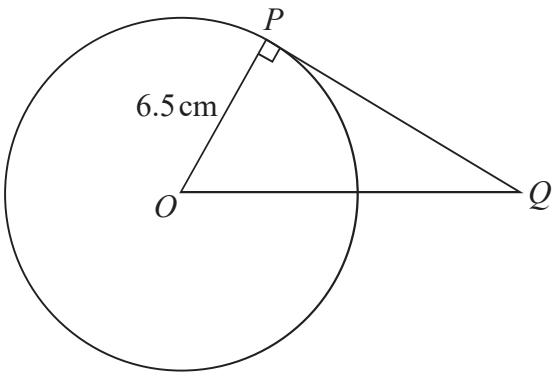


Diagram **NOT** accurately drawn

(a) Work out the area of the circle.
Give your answer correct to 3 significant figures.

..... cm^2

(2)

PQ is the tangent to the circle at P
$OQ = 10.5$ cm

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

..... cm

(3)

(Total for Question 16 is 5 marks)

17 (a) Express 600 as a product of powers of its prime factors.
Show your working clearly.

.....

(3)

(b) Simplify $\dfrac{5^{12}}{5^2 \times 5}$

Give your answer as a power of 5

.....

(2)

(Total for Question 17 is 5 marks)

18 (a) Solve the inequality $e - 2 < 0$

.....

(1)

(b) Solve the inequality $5 - 3e < 4$

.....

(2)

(c) Write down the integer value of e that satisfies both of the inequalities

$e - 2 < 0$ and $5 - 3e < 4$

.....

(1)

(Total for Question 18 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS