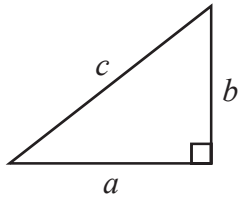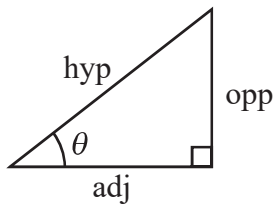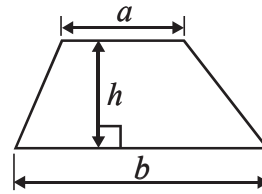# International GCSE MATHEMATICS

FORMULAE SHEET – FOUNDATION TIER

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

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

$adj = hyp \times \cos\theta$
$opp = hyp \times \sin\theta$
$opp = adj \times \tan\theta$

Volume of prism = area of cross section × length
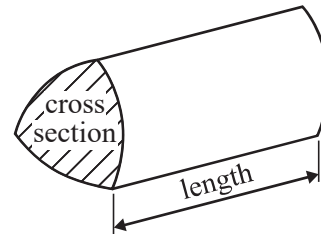
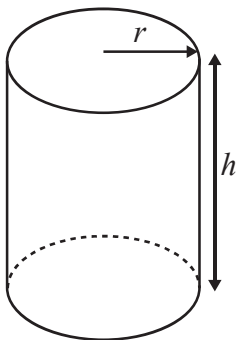*or* $\sin\theta = \dfrac{\text{opp}}{\text{hyp}}$

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

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

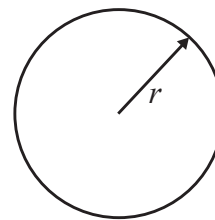Circumference of circle = $2\pi r$

Area of circle = πr^2

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

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

P 4 4 6 1 1 A 0 2 2 0

Answer ALL TWENTY ONE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1   Complete the following estimates by writing a suitable metric unit on each of the dotted lines.

(a) The length of a small car is about 400 ....

(1)

(b) The weight of a new pencil is about 4 ....

(1)

(c) The volume of a coffee cup is about 200 ....

(1)

(Total for Question 1 is 3 marks)

2   Ryan buys 8 postage stamps.
The stamps cost £0.60 each.
He pays with a £10 note.

Work out how much change Ryan should receive.

£...

(Total for Question 2 is 3 marks)

Do NOT write in this space.

3   The secretary in a school office posted 90 letters on one day.
    The pictogram shows information about the cost of postage for each of these letters
    except those costing 69 pence.

50 pence	✉ ✉ ✉ ✉ ✉ ✉ ✉ ✉ ✉ ✉
60 pence	✉ ✉ ✉ ✉ ✉ ◁
69 pence	
90 pence	✉ ◁
110 pence	✉

There were 40 letters that cost 50 pence each to post.

(a) Find the number of letters that cost 110 pence each to post.

....
                                                                        (1)

(b) Find the number of letters that cost 60 pence each to post.

....
                                                                        (1)

There were 17 letters that cost 69 pence each to post.

(c) Show this information on the pictogram.
                                                                        (1)

(d) Write down the mode of the cost of postage.

.... pence
                                                                        (1)

(Total for Question 3 is 4 marks)

Do NOT write in this space.

P4 4 6 1 1 A 0 4 2 0

4 Cara measures her temperature in degrees Celsius.
Here is part of the scale on her thermometer.
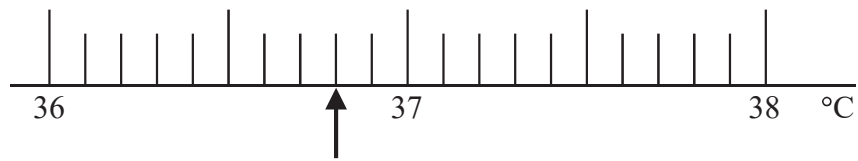
(a) Write down the number marked with the arrow.

....
(1)

Misha has a temperature of 98.3 degrees Fahrenheit.

(b) Mark with an arrow the number 98.3

(1)

(Total for Question 4 is 2 marks)

Do NOT write in this space.

P 4 4 6 1 1 A 0 5 2 0

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

                         13   20   27   34   41

(a) Write down the next two terms of the sequence.

....

(2)

(b) Explain how you worked out your answer.

....

(1)

(c) Work out the 20th term of the sequence.

....

(2)

(Total for Question 5 is 5 marks)

6 The diameter of Jupiter is 142 796 kilometres.

(a) Write the number 142 796 correct to the nearest thousand.

....

(1)

Jupiter takes 11.862 earth years to orbit the sun.

(b) Write the number 11.862 correct to 1 decimal place.

....

(1)

Jupiter is 778.3 million kilometres from the sun.

(c) Write the number 778.3 correct to 3 significant figures.

....

(1)

(Total for Question 6 is 3 marks)

7 Trina collects eggs from her hens.
She labels their eggs small or medium or large.

20% of the eggs she collected in May were small.
24% of the eggs she collected in May were large.

(a) What percentage of the eggs she collected in May were medium?

....%

(2)

(b) Express 24% as a fraction.
Give your fraction in its simplest form.

....

(2)

Trina collected 75 eggs in May.

(c) Work out 20% of 75

....

(2)

(Total for Question 7 is 6 marks)

Do NOT write in this space.

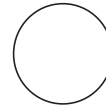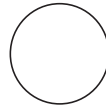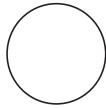**8** Here are four discs.
Each disc has a number on it.

(7)   (2)   (3)   (5)

These four discs are arranged to make the number 7235

(a) Arrange the four discs to make an even number.

( ) ( ) ( ) ( )

(1)

(b) Arrange the four discs to make the smallest possible number.

( ) ( ) ( ) ( )
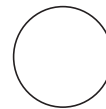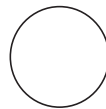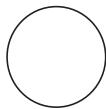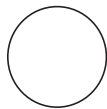
(1)

(c) Arrange two of the discs to make a square number.

( ) ( )
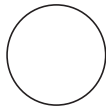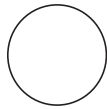
(1)

(d) Arrange two of the discs to make a cube number.

( ) ( )
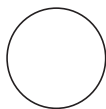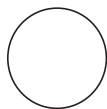
(1)

(e) Arrange two of the discs to make a prime number.

( ) ( )

(1)
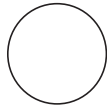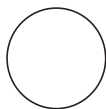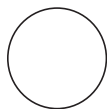
(Total for Question 8 is 5 marks)

Do NOT write in this space.

9 The diagram shows a shape on a centimetre grid and a line *AB*.
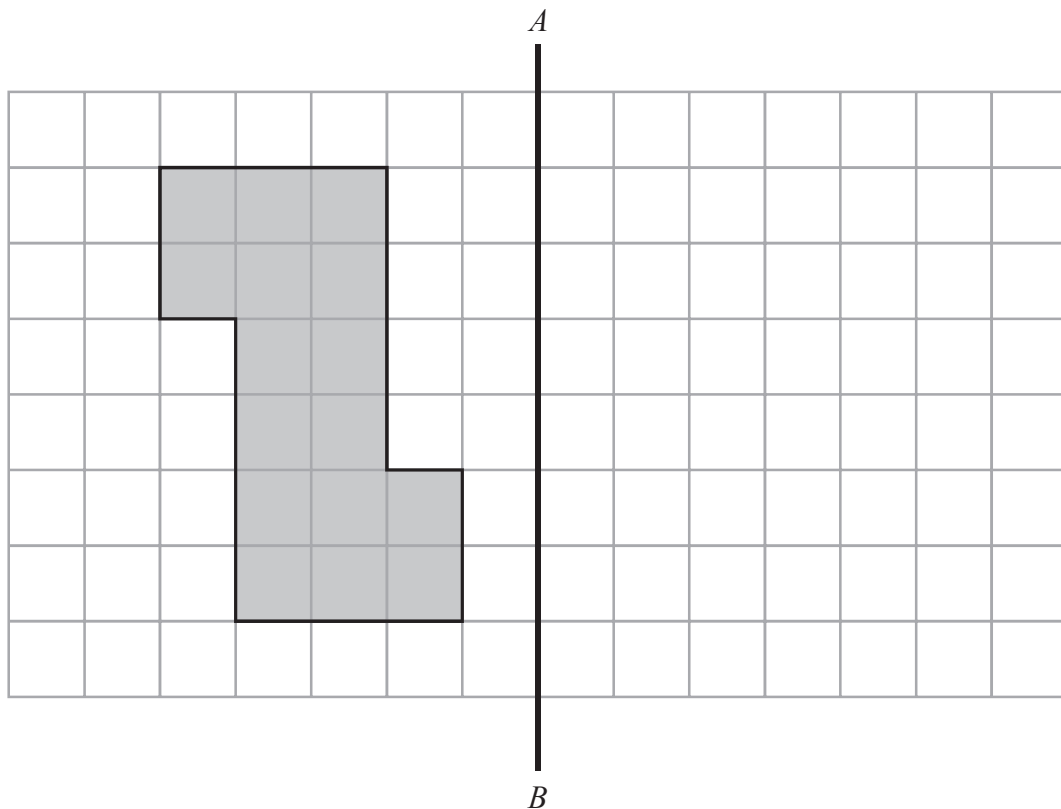
(a) Measure the length of the line *AB*.

.... cm
(1)

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

....
(1)

(c) Work out the perimeter of the shape.

.... cm
(1)

(d) Work out the area of the shape.

.... cm^2
(1)

(e) Reflect the shape in the line *AB*.

(2)

(Total for Question 9 is 6 marks)

P 4 4 6 1 1 A 0 9 2 0

10 This formula can be used to work out the value, in pounds (£), of a number of shares in a water company.

Value of shares = 2.5 × number of shares

(a) Work out the value of 400 shares.

£...
(1)

The value of Elisha's shares in the water company is £875

(b) Work out the number of shares that Elisha has.

....
(2)

The value of *n* shares in the water company is £*V*.

(c) Write down a formula for *V* in terms of *n*.

....
(2)

(Total for Question 10 is 5 marks)

Do NOT write in this space.

11 Rohan plays for his village cricket team.
Here are the number of runs he scored in each of six games.

<div align="center">12   4   35   67   32   54</div>

(a) Find the range of the number of runs Rohan scored.

....
(2)

(b) Find the mean of the number of runs Rohan scored.

....
(2)

One of the six games is picked at random.

(c) Find the probability that Rohan scored more than 50 runs in this game.

....
(2)

(Total for Question 11 is 6 marks)

12
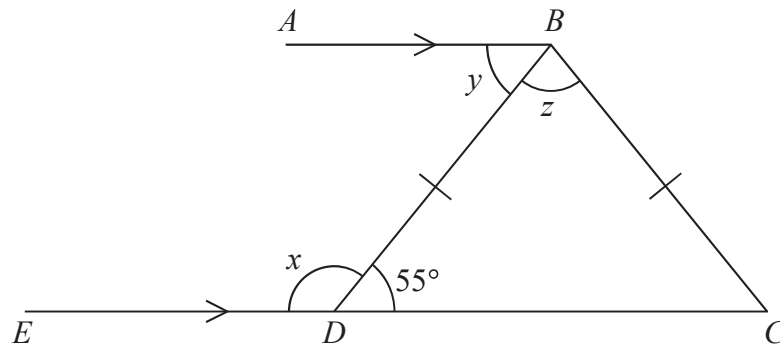
Diagram **NOT** accurately drawn

AB and *EDC* are parallel lines.
BD = *BC*
Angle *BDC* = 55°

(a) (i) Work out the size of angle *x*.

.... °

(ii) Give a reason for your answer.

....

....

(2)

(b) Find the size of angle *y*.

.... °

(1)

(c) Work out the size of angle *z*.

.... °

(2)

(Total for Question 12 is 5 marks)

13

1 euro = 120 yen
£1 = 1.2 euros

(a) Change 250 euros to yen.

.... yen

(2)

(b) Change 9000 yen to euros.

.... euros

(2)

(c) Change £50 to yen.

.... yen

(2)

(Total for Question 13 is 6 marks)

14 (a) Work out the value of 2.5^3

....

(1)

(b) Work out the value of $\dfrac{451.4}{14.1 + 10.3}$

....

(2)

(c) Work out the value of $\sqrt{7.8^2 - 7.2^2}$

....

(2)

(Total for Question 14 is 5 marks)

15 (a) Solve $3x + 5 = 26$
Show clear algebraic working.

$x = $ ....
(2)

(b) Solve $4(5y - 1) = 3(6y + 7)$
Show clear algebraic working.

$y = $ ....
(3)

(Total for Question 15 is 5 marks)

Do NOT write in this space.

16 The diagram shows a shape with one line of symmetry.

10 cm
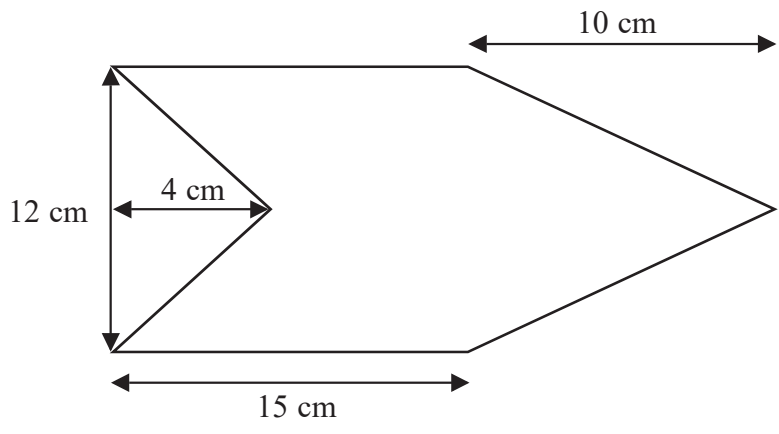
Diagram **NOT** accurately drawn

4 cm

12 cm

15 cm

Work out the area of the shape.

.... cm²

(Total for Question 16 is 4 marks)

Turn over ▶

P 4 4 6 1 1 A 0 1 5 2 0

17 Find the sum of the interior angles of a polygon with 7 sides.

....°

(Total for Question 17 is 2 marks)

18 A jar contains 72 coloured beads.
There are 24 red beads, 28 blue beads and 20 green beads.

Ajit takes at random a bead from the jar.

(a) Find the probability that the bead Ajit takes is

(i) red,

....

(ii) blue or green.

....

(3)

A second jar contains coloured beads.
Ajit takes at random a bead from the jar.
The probability that the bead is yellow is 0.08
The probability that the bead is pink is 0.1

(b) Find the probability that the bead is neither yellow nor pink.

....
(2)

A third jar contains 100 coloured beads.
20 of these beads are brown.

Ajit takes at random a bead from the jar.
He records the colour of the bead and then returns the bead to the jar.
He does this 60 times.

(c) Work out an estimate for the number of times Ajit records a brown bead.

....
(2)

(Total for Question 18 is 7 marks)

Do NOT write in this space.

P44611A01720

19 Eloy's height was 125 cm when his age was 7 years.
His height was 153 cm when his age was 12 years.

(a) Work out the percentage increase in Eloy's height between the ages of 7 and 12 years.

....%

(3)

Eloy's height at the age of 12 years was 85% of his height at the age of 20 years.

(b) Work out Eloy's height when his age was 20 years.

.... cm

(3)

(Total for Question 19 is 6 marks)

Do NOT write in this space.

P44611A01820

20 (a) Expand and simplify $3(2c - 5) - 2(c - 4)$

....
(2)

(b) Simplify $(4e^3)^2$

....
(2)

(c) Expand and simplify $(a + 5)(a - 1)$

....
(2)

(Total for Question 20 is 6 marks)

Do NOT write in this space.

P 4 4 6 1 1 A 0 1 9 2 0

21

Diagram **NOT** accurately drawn

15 cm

10 cm

A *D* 12.5 cm *C*

B
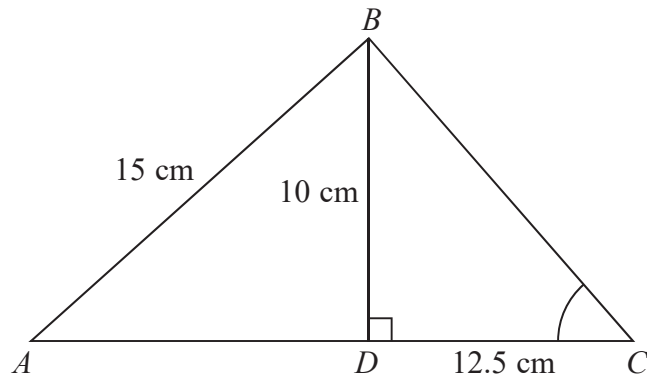
ABC is a triangle.
The point *D* lies on *AC*.
Angle *BDC* = 90°
BD = 10 cm, *AB* = 15 cm and *DC* = 12.5 cm.

(a) Calculate the length of *AD*.
    Give your answer correct to 3 significant figures.

.... cm

(3)

(b) Calculate the size of angle *BCD*.
    Give your answer correct to 1 decimal place.

....°

(3)

(Total for Question 21 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS