## Collins

## AQA

GCSE

# Mathematics 

## SET B - Paper 3 Foundation Tier

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## Materials

## For this paper you must have:

- calculator
- mathematical instruments

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer all questions.
- You must answer the questions in the space provided.
- In all calculations, show clearly how you work out your answer.


## Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80 .
- You may use additional paper, graph paper and tracing paper.

Name:

1 Here is a shape drawn on a grid of squares.


1 (a) Circle the number of lines of symmetry of the shape.
0
1
2
3
4

1 (b) Circle the order of rotational symmetry of the shape.

2 A piece of wood is 20 cm long measured correct to the nearest centimetre.

Circle the correct interval showing the limits of the length, $l$.
$19.5<l<20.5$
$19.5 \leqslant l<20.5$
$19.5<l \leqslant 20.5$
$19.5 \leqslant l \leqslant 20.5$

3 Circle the number that is not a prime number.

2
3
7
9

4 A shape made with 10 centimetre cubes is shown on the isometric grid.


On the grids below draw the plan, side elevation and front elevation.


Front elevation


Side elevation


5 Work out all the factors of 20.

6 Circle the word that describes the line $A B$.

Chord
Diameter
Radius
Tangent

7 Rod has 3 pairs of jeans, 4 T-shirts and 2 jackets.
He always wears jeans, a T-shirt and a jacket.
How many possible different outfits could he wear?

Answer

8 Here is a number machine.


8 (a) Work out the output when the input is 5.

Answer

8 (b) Work out the input when the output is 11.

9 This table shows the entry cost for using a swimming pool.

| Stacksbridge Pool <br> Open: Monday: 8 am to 2 pm |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Adult <br> (16 and over) | Senior citizens <br> $(60$ and over) | Child <br> (5 years to <br> 15 years) | Infant <br> (Under 5) |
| Peak |  |  |  |  |
| Monday - Friday 6 am to 9 am <br> Monday - Friday 5 pm to 8 pm <br> Saturday and Sunday - All day | $£ 4.50$ | $£ 4.00$ | $£ 2.50$ | $£ 1.00$ |
| Off-peak | $£ 3.50$ | $£ 3.00$ | $£ 2.00$ | $£ 1.00$ |

9 (a) Neil is 18 years old and swims each day Monday to Friday from 8 am to 9 am .
How much does he pay each week?

Answer f

9 (b) The Watson family go swimming on Friday at 1 pm .
In the family are:
Mr and Mrs Watson who are both 45 years old.
Andy who is 17 years old.
Edie who is 13 years old.
Ben who is 4 years old.
Bill who is 68 years old.
How much do they pay altogether?
(c) The swimming pool introduces a 'Leisure Card' that costs $£ 55$ a month.

This will allow a holder of the card to swim at anytime.
Assuming that Neil would normally swim for 20 days a month, how much will he save by buying a Leisure Card?

## Answer f

10 Here are some coins.


Tom and Jerry divide the coins.
The amount of money they now have is in the ratio 3:4
What coins do they each have now?

Tom

Jerry

Here are eight numbers.
3
8
6
9
11
12
5
2

Work out the mean of the numbers.

Answer

12 Work out the size of angle $x$.

[2 marks]

13 Large cuboids are 8 cm by 6 cm by 3 cm .
Small cuboids are 2 cm by 4 cm by 3 cm .


13 (a) Show that the volume of one large cuboid is the same as the total volume of six small cuboids.

13 (b) The large and small cuboids are stacked in alternate layers.
The bottom layer is one large cuboid.
The next layer is made from six small cuboids.
The total volume of the stack is $720 \mathrm{~cm}^{3}$.
How many of each type of cuboid are used in the stack?

## Small cuboids

Cereal is sold in two sizes.
A small packet contains 350 grams and costs 79p.
A large box contains 750 grams and costs $£ 1.85$.
Which size is the best value?
You must show your working.

15 The table shows information about three journeys.
Complete the table.

| Journey | Distance | Time | Average speed |
| :---: | :---: | :---: | :---: |
| A | 32 km |  | $64 \mathrm{~km} / \mathrm{h}$ |
| B |  | 1 h 30 mins | $50 \mathrm{~km} / \mathrm{h}$ |
| C | 50 km | 50 mins |  |

16 A café owner records the average monthly temperature and monthly sales of ice cream over 10 months.


16 (a) The scatter graph shows positive correlation.
Write down the relationship between average monthly temperature and monthly sales of ice cream.

16 (b) The average monthly temperature for the next month is predicted to be $22^{\circ} \mathrm{C}$. Use the graph to estimate the sales of ice cream that month.

You must show your working.

Answer

17 A two-digit prime number is one more than a square number.
Work out a possible value of the prime number.

Answer

18 f 3000 is invested in an account that pays $3 \%$ compound interest per year.
How much will be in the account after three years?

Answer $£$

19 (a) Simplify $x^{3} \times x^{6}$

## Answer

19 (b) Simplify $x^{12} \div x^{2}$

## Answer

20 Here are two column vectors.

$$
a=\binom{2}{3} \quad b=\binom{6}{-2}
$$

Work out $2 \mathbf{a}+\mathbf{b}$.

Answer

21 Work out the next two terms of this quadratic sequence.
3
5
8
12
17
23
[2 marks]

Answer
and

22 Enlarge the shape by a scale factor of $\frac{1}{3}$


23 Two inequalities are shown.


Write down the integers that are in both inequalities.

Here are the equations of four lines.

Line A: $y=3 x-4$

Line C: $y=3 x+3$

Line B: $y=4 x-3$

Line D: $y=-4 x-4$
(b) Which two lines intersect on the $y$-axis?

Answer and

Match each graph to the equations.


26 A large candle exerts a pressure of 2 Pa on its base.
As the candle burns the pressure decreases.
After 2 hours the pressure is 0.5 Pa

Work out the rate of change of pressure.
Give your answer in Pa/hour.

27 Solve the simultaneous equations

$$
\begin{aligned}
& 3 x+2 y=2 \\
& x+4 y=9
\end{aligned}
$$

$$
\begin{aligned}
& x= \\
& y=
\end{aligned}
$$

28 A bag contains 10 balls.
4 of the balls are red and 6 are blue.

A ball is taken at random from the bag.
The ball is replaced and another ball is taken at random from the bag.
28 (a) Complete the tree diagram.


28 (b) Use the tree diagram, or otherwise, to work out the probability that both balls were the same colour.

29
The quadratic equation $x^{2}+x-6=0$ will factorise to $(x-2)(x+3)=0$
Circle the correct solutions to the equation.

$$
x=2 \text { and } 3 \quad x=2 \text { and }-3 \quad x=-2 \text { and } 3 \quad x=-2 \text { and }-3
$$

30
(a) Factorise $x^{2}-25$
[1 mark]

## Answer

30 (b) Show that $(x+2)^{2}-(x+1)^{2} \equiv 2 x+3$

31 (a) Show that the length $x$ in the triangle below is 6.36 cm to 2 decimal places.


Not drawn
accurately

31 (b) A cone has a half vertical angle of $32^{\circ}$ and a slant height $l$ of 12 cm .


Work out the curved surface area of the cone.
The formula for the curved surface area of a cone is
Curved surface area $=\pi \times$ radius of base $\times$ slant height

Answer
$\mathrm{cm}^{2}$

32 The diagram shows a right angled triangle.
One of the other angles is $60^{\circ}$.


Not drawn
accurately

Circle the exact value of $\sin 60^{\circ}$.
$\frac{1}{2}$
$\frac{\sqrt{3}}{2}$
0.866
$\frac{2}{\sqrt{3}}$

