Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

MATHEMATICS **0580/21**

Paper 2 (Extended) **May/June 2021**

1 hour 30 minutes

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π, use either your calculator value or 3.142.

INFORMATION

- The total mark for this paper is 70.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **12** pages. Any blank pages are indicated.

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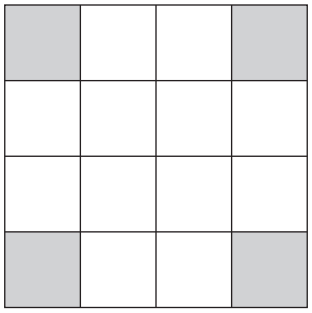

(a) Write down the order of rotational symmetry of this diagram.

View solution

..... [1]

(b) On the diagram, draw all the lines of symmetry. View solution [2]

2 The probability that a train is late is 0.15 .

View solution

Write down the probability that the train is not late.

..... [1]

3 The stem-and-leaf diagram shows the number of hours that each of 16 students studied last week.

1	2	5	6	8	
2	0	1	1	7	9
3	2	3	4	5	
4	4	5	7		

Key: 1 | 2 represents 12 hours

Find

(a) the median,

View solution

..... h [1]

(b) the mode, View solution

..... h [1]

(c) the range. View solution

..... h [1]

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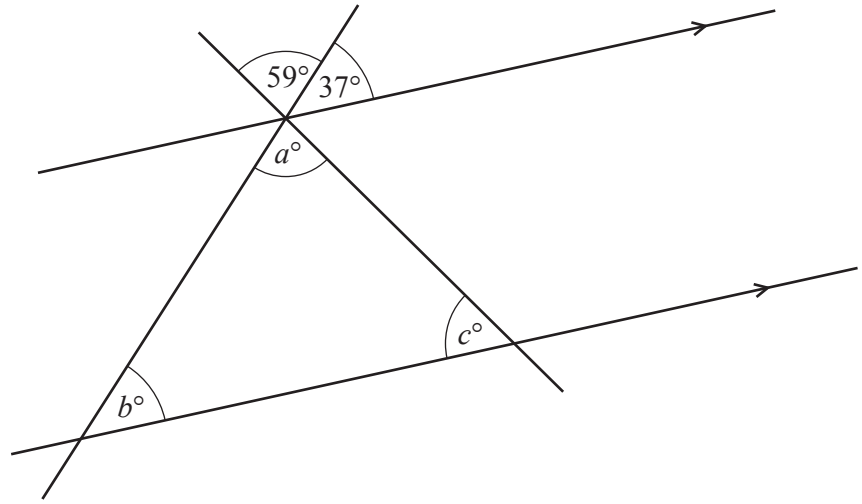

NOT TO SCALE

View solution

The diagram shows two parallel lines intersected by two straight lines.

Find the values of a, b and c.

$a =$ .....

$b =$ .....

$c =$ ..... [3]

5 Work out.

(a) $\begin{pmatrix} 6 \\ -5 \end{pmatrix} + \begin{pmatrix} 8 \\ -1 \end{pmatrix}$

View solution

( ) [1]

(b) $3\begin{pmatrix} -4 \\ 7 \end{pmatrix}$

View solution

( ) [1]

6 **(a)** The nth term of a sequence is $n^2 + 3n$.

View solution

Find the first three terms of this sequence.

....., ..., ... [2]

(b) These are the first five terms of a different sequence.

View solution

25 18 11 4 −3

Find the nth term of this sequence.

..... [2]

7 Solve the simultaneous equations.
You must show all your working.

View solution

$$2x + y = 3$$
$$x - 5y = 40$$

$x =$ .....

$y =$ ..... [3]

8 **Without using a calculator**, work out $1\frac{3}{8} - \frac{5}{6}$.

You must show all your working and give your answer as a fraction in its simplest form.

View solution

..... [3]

9 A is the point $(5, -5)$ and B is the point $(9, 3)$.

(a) Find the coordinates of the midpoint of AB.

View solution

(....., ...) [2]

(b) Find the length of AB.

View solution

..... [3]

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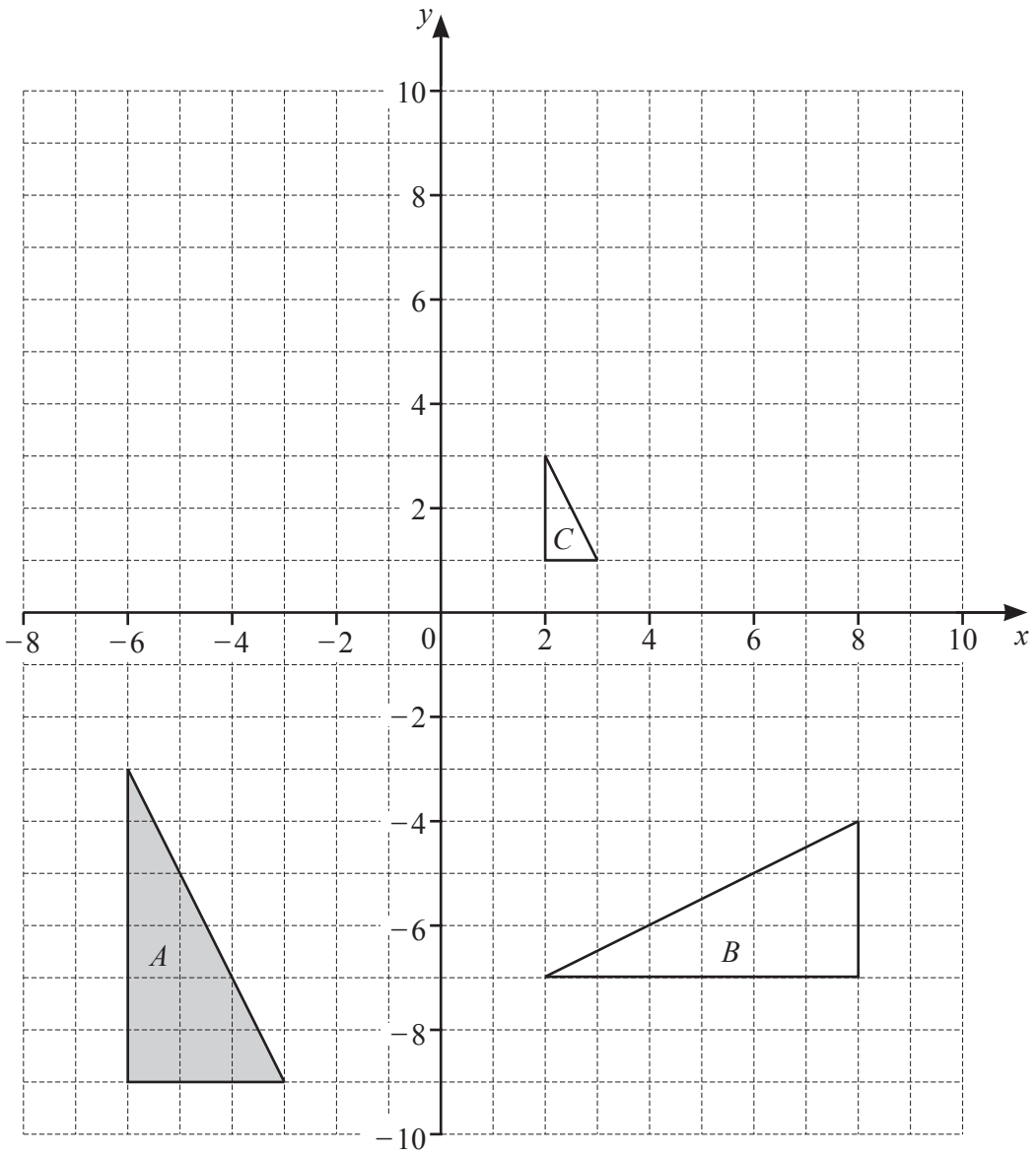

(a) Describe fully the **single** transformation that maps

(i) triangle A onto triangle B,

.....

..... [3]

View solution

(ii) triangle A onto triangle C.

.....

..... [3]

View solution

(b) Draw the image of triangle A after a translation by the vector $\begin{pmatrix} 2 \\ 10 \end{pmatrix}$. [2]

View solution

11 **(a)** Simplify fully.

$$(4ab^5)^4$$

View solution

..... [2]

(b) $2p^{\frac{1}{3}} = 6$

View solution

Find the value of p.

$p =$ ..... [1]

(c) $81^2 \div 3^t = 9$

View solution

Find the value of t.

$t =$ ..... [2]

12 The profit a company makes decreases exponentially at a rate of 0.9% per year.
In 2014, the profit was \$9500.

View solution

Calculate the profit in 2019.

\$ ..... [2]

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13 On a map, a lake has an area of $32\,cm^2$.
The scale of the map is 1 : 24 000.

Calculate the actual area of the lake.
Give your answer in km^2.

View solution

..... km^2 [2]

14 y is directly proportional to the square root of $(x-3)$.
When $x = 28$, $y = 20$.

Find y when $x = 39$.

View solution

$y =$ ..... [3]

15 Make h the subject of the formula $2mh = g(1-h)$.

View solution

$h =$ ..... [4]

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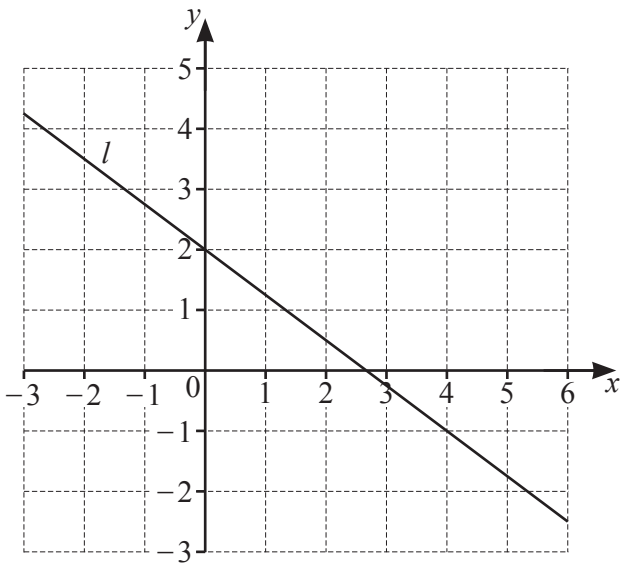


(a) Find the gradient of line l.

View solution

..... [2]

(b) Find the equation of line l in the form $y = mx + c$.

View solution

$y =$ ..... [2]

(c) Find the equation of the line that is perpendicular to line l and passes through the point $(12, -7)$. Give your answer in the form $y = mx + c$.

View solution

$y =$ ..... [3]

17 A bag contains 3 blue buttons, 8 white buttons and 5 red buttons.
Two buttons are picked at random from the bag, without replacement.

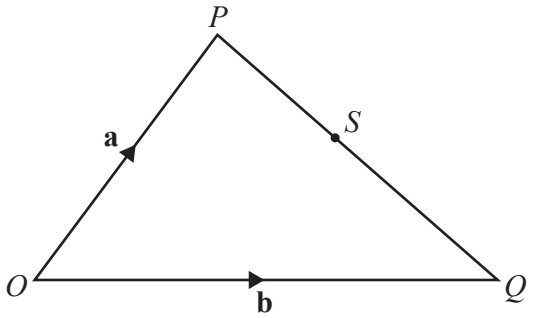
View solution

Work out the probability that the two buttons are either both red or both white.

..... [3]

18

View solution



NOT TO SCALE

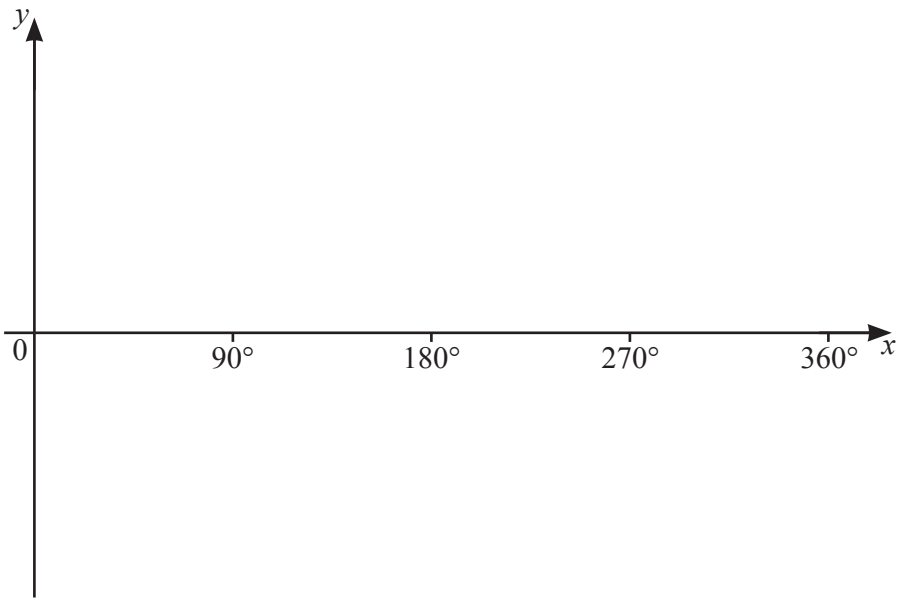
S is a point on PQ such that $PS : SQ = 4 : 5$.

Find $\overrightarrow{OS}$, in terms of **a** and **b**, in its simplest form.

$\overrightarrow{OS}$ = ... [2]

19 **(a)** Sketch the graph of $y = \tan x$ for $0° \leqslant x \leqslant 360°$.

View solution



[2]

(b) Solve the equation $5\tan x = 1$ for $0° \leqslant x \leqslant 360°$.

View solution

$x =$ ..... or $x =$ ..... [2]

20 The distance between two towns is 600 km, correct to the nearest 10 km.
A car takes 8 hours 40 minutes, correct to the nearest 10 minutes, to travel this distance.

View solution

Calculate the lower bound for the average speed of the car in km/h.

..... km/h [3]

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