

CANDIDATE
NAME

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CENTRE
NUMBER

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CANDIDATE
NUMBER

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MATHEMATICS

0626/04

Paper 4 (Extended)

May/June 2018

1 hour 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Geometrical instruments
 Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams and graphs.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.

CALCULATORS MAY NOT BE USED IN THIS PAPER.

If working is required for any question it must be shown below that question.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The total of the marks for this paper is 84.

This syllabus is regulated for use in England as a Cambridge International Level 1/Level 2 (9–1) Certificate.

This document consists of **15** printed pages and **1** blank page.

- 1 (a) Write 6.25×10^{-3} as an ordinary number.

..... [1]

- (b) Work out $0.03 \times (2 \times 10^6)$.
Give your answer in standard form.

..... [2]

- 2 (a) Write 231 as a product of prime factors.

..... [2]

- (b) Abby and Salma are racing in go-karts.
Abby takes 75 seconds to complete each lap.
Salma takes 100 seconds to complete each lap.
At the start of the race, they line up together on the start line.

How many **minutes** later do they next cross the start line together?

..... minutes [2]

3 Work out $5\frac{1}{3} \times 1\frac{3}{4}$.

Give your answer as a mixed number in its lowest terms.

..... [3]

- 4 The exterior angle of a regular polygon is 12° .
The polygon has n sides.

Find the value of n .

$n =$ [2]

- 5 There are 300 marbles in a bag.
Luna carries out an experiment to estimate how many of the marbles are red.
She takes a marble out of the bag at random, records its colour and replaces it in the bag.
Luna does this 50 times and she records a red marble 11 times.

Estimate how many of the marbles in the bag are red.

..... [2]

6 Solve.

(a) $7 - 2(x - 3) = 6x + 1$

$x = \dots\dots\dots$ [3]

(b) $x^2 - 4x = 0$

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [2]

7 (a) Find the value of each of the following.

(i) 10^0

$\dots\dots\dots$ [1]

(ii) $64^{\frac{1}{2}}$

$\dots\dots\dots$ [1]

(iii) $12^5 \div 12^3$

$\dots\dots\dots$ [2]

(b) Harry writes:

$$x^{-1} = \frac{1}{x} \quad \text{so} \quad x^{-2} = \frac{2}{x}$$

Is Harry correct?
Explain how you know.

$\dots\dots\dots$
 $\dots\dots\dots$ [1]

- 8 (a) The n th term of a sequence is given by $7 - 5n$.

Which term in the sequence has the value -88 ?

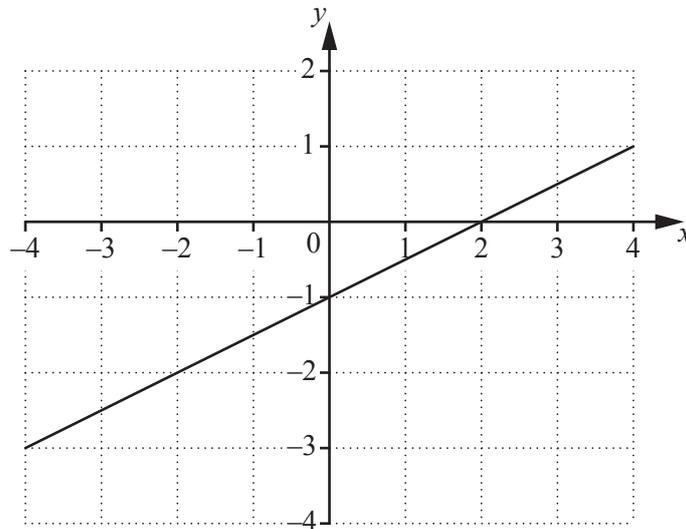
..... [2]

- (b) Find an expression for the n th term of the following sequence.

3 24 81 192 375 ...

..... [2]

9



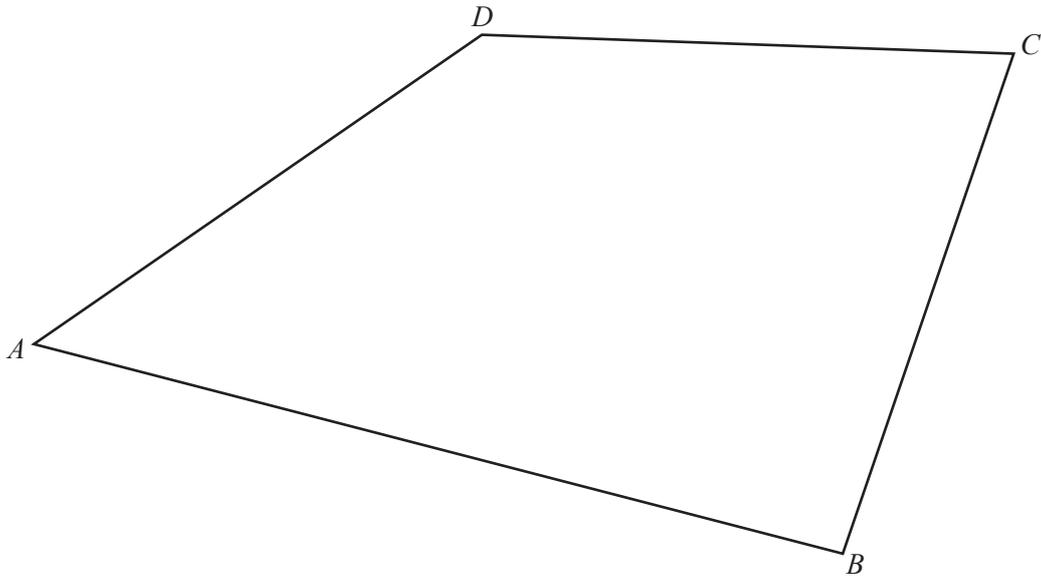
The diagram shows the graph of a straight line.

Find the equation of this straight line.

Give your answer in the form $y = mx + c$.

$y =$ [3]

- 10 Use a straight edge and compasses only for this question.
Leave in all your construction arcs.



Construct and shade the region inside the quadrilateral $ABCD$ which is

- nearer to AB than AD
- and
- nearer to C than D .

[5]

- 11 By rounding each number correct to 1 significant figure, estimate the value of

$$\sqrt{\frac{19.01 - 1.95}{0.016}}$$

..... [2]

12 (a) Show that $0.\dot{3}\dot{1}$ can be written as $\frac{31}{99}$.

[2]

(b) Write $\sqrt{80} + \sqrt{45}$ in the form $a\sqrt{5}$, where a is an integer.

..... [2]

13 (a) Expand and simplify.

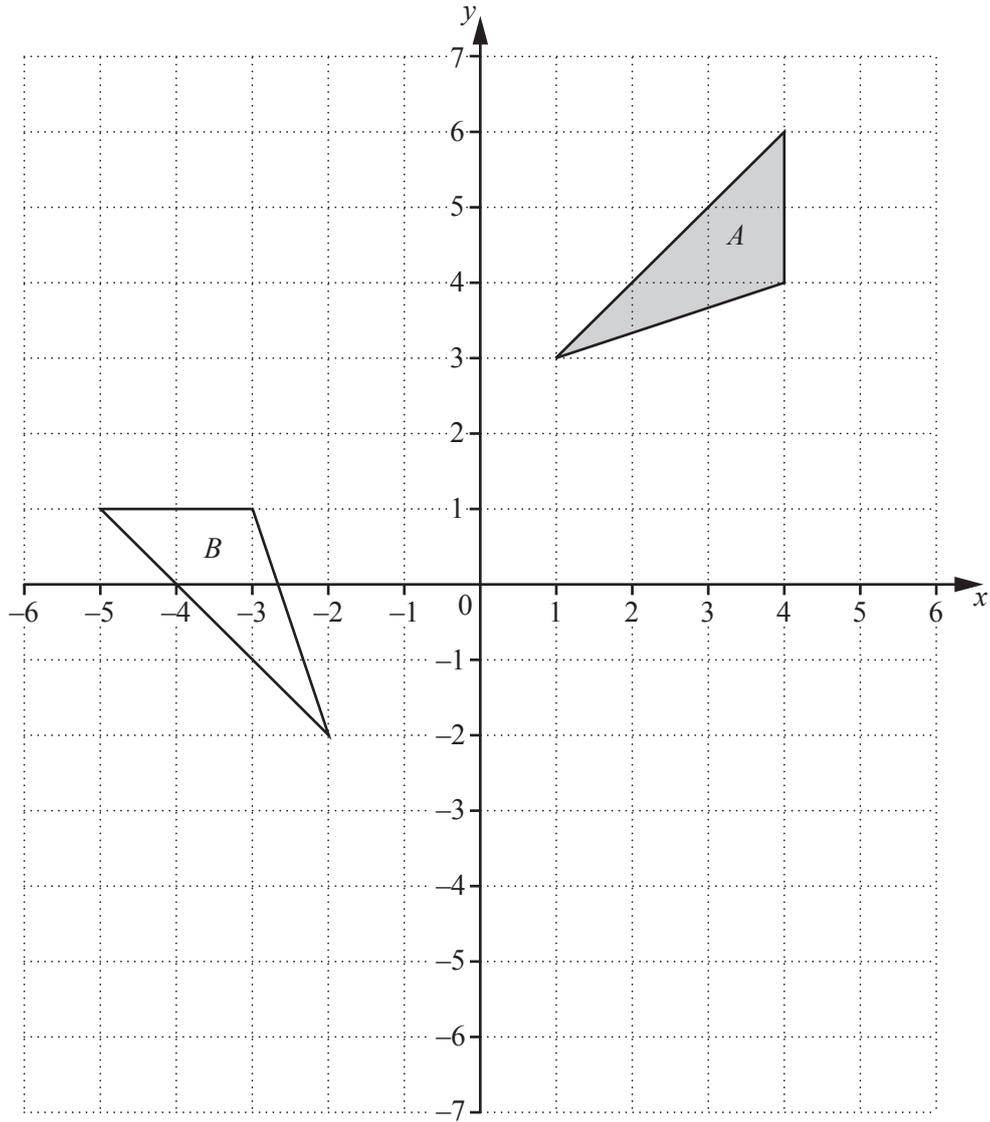
$$(2x - 1)(5 - x)$$

..... [2]

(b) Write as a single fraction in its simplest form.

$$\frac{5}{3x - 2} - \frac{7}{x + 1}$$

..... [3]



- (a) Describe fully the **single** transformation that maps triangle A onto triangle B .

.....
 [3]

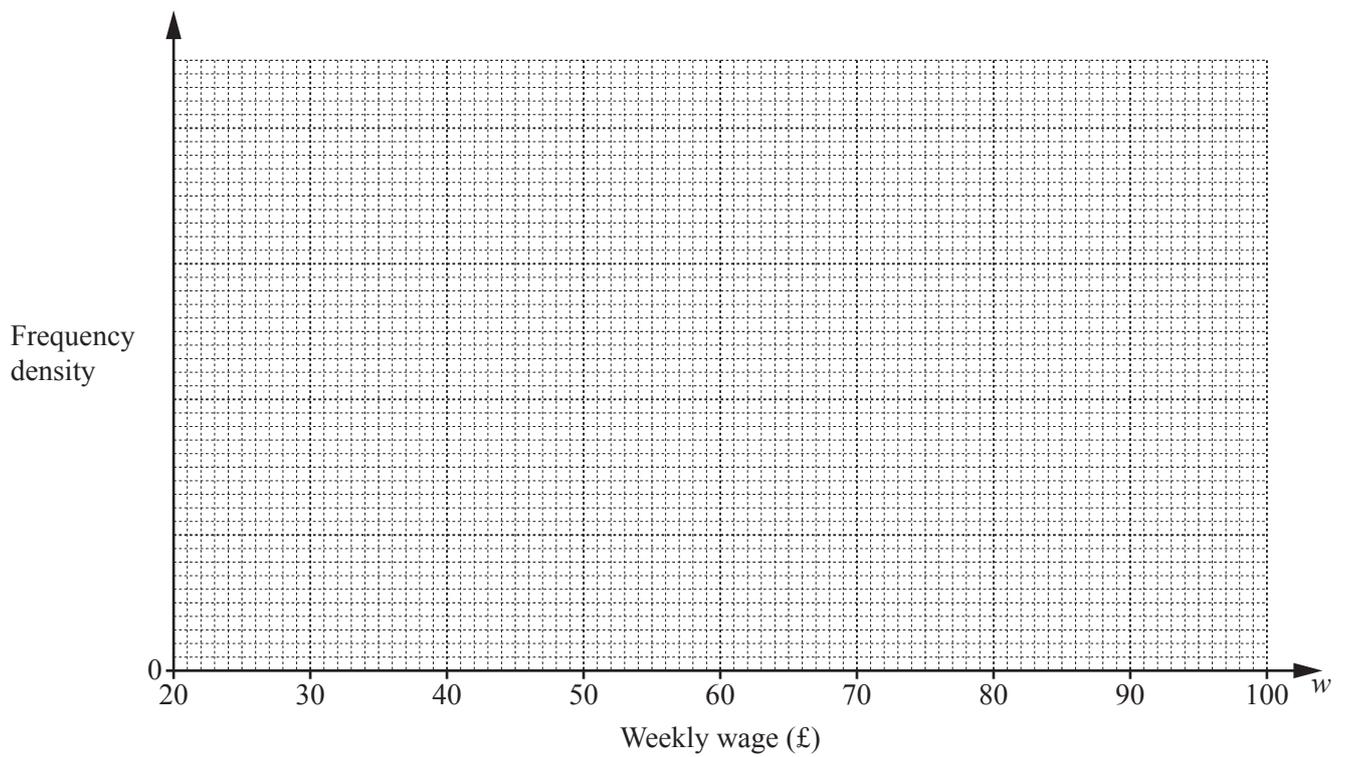
- (b) On the grid, draw the image of triangle A after the transformation represented by the matrix $\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$.

[3]

15 The table shows information about the weekly wages earned by each of 100 part-time workers.

Weekly wage (£ w)	Frequency
$20 \leq w < 50$	15
$50 \leq w < 60$	35
$60 \leq w < 75$	30
$75 \leq w < 100$	20

On the grid, draw a histogram to represent this information.



[4]

- 17 A circle has equation $x^2 + y^2 = 25$.
The points $A(4, 3)$ and $B(p, q)$ are the end points of a diameter of the circle.
The circle has radius r .

(a) Find the value of p , the value of q and the value of r .

$$p = \dots\dots\dots$$
$$q = \dots\dots\dots$$
$$r = \dots\dots\dots [3]$$

(b) Shania says:

The line $4x + 3y = 25$ is a tangent to the circle $x^2 + y^2 = 25$ because $\frac{3}{4} \times -\frac{4}{3} = -1$
and they meet at $(4, 3)$.

Show that Shania's reasoning is correct.

[3]

- 18 (a) y is inversely proportional to x .
 $y = 10$ when $x = 4$.

(i) Find an equation connecting y and x .

..... [2]

(ii) Find the value of x when $y = \frac{5}{8}$.

$x =$ [2]

- (b) r is directly proportional to the cube root of V .

Complete the statement.

When r is multiplied by 2, V is multiplied by [2]

19 Fifteen people go on an activity holiday.

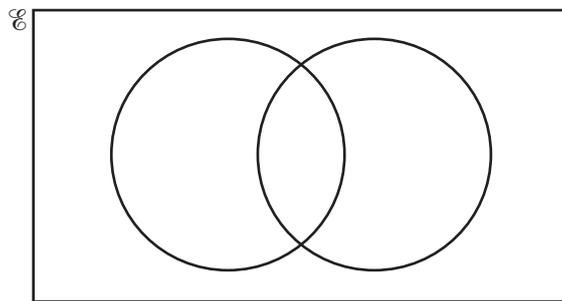
Of these 15 people:

- 9 go canoeing
- 4 go abseiling
- 5 do not go canoeing or abseiling

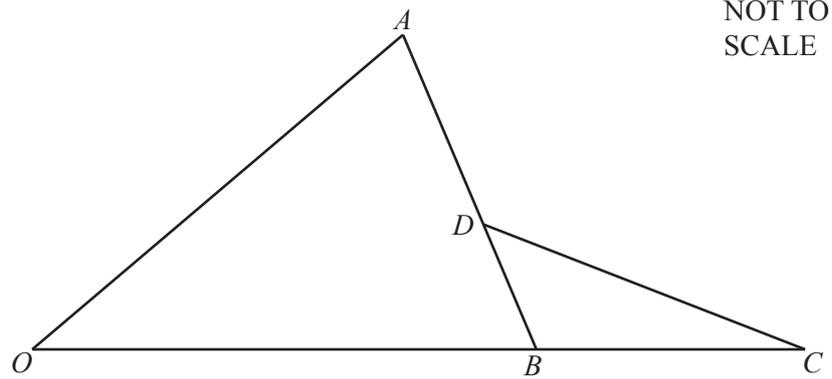
A person is chosen at random from those who go canoeing or abseiling or both.

Find the probability that this person goes canoeing or abseiling but does not do both activities.

You may use this diagram to help you.



..... [4]



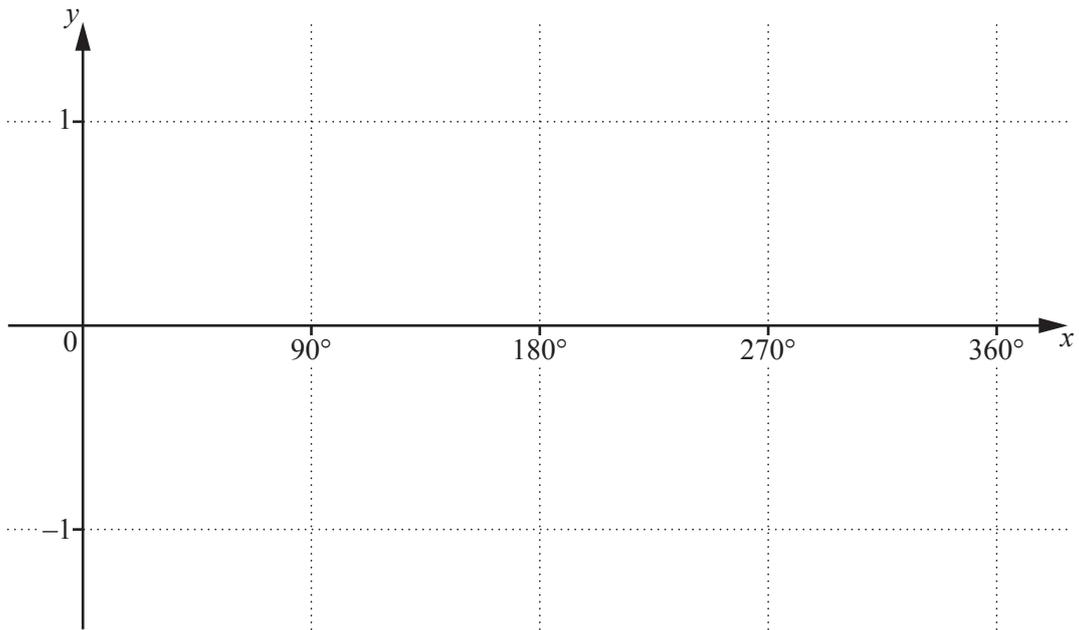
In the diagram,

- OBC is a straight line
- $\vec{OA} = 2\mathbf{a}$ and $\vec{OB} = 3\mathbf{b}$
- $OB : BC = 3 : 2$
- $\vec{AD} = \frac{3}{5}\vec{AB}$.

Find an expression, in terms of \mathbf{a} and \mathbf{b} , for \vec{DC} .

$$\vec{DC} = \dots\dots\dots [4]$$

- 21 (a) On the grid, sketch the graph of $y = \cos x$ for $0^\circ \leq x \leq 360^\circ$.



[2]

- (b) Find all the solutions of the equation $2 \cos x = 1$ for $0^\circ \leq x \leq 360^\circ$.

..... [2]

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