Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education (9–1)

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

8384144865

MATHEMATICS **0626/02**

Paper 2 (Extended) **October/November 2018**

1 hour

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.
Electronic calculators should be used.
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.
For π, use either your calculator value or 3.142.

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 60.

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

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CAMBRIDGE International Examinations

[Turn over

1 **(a)** Write 120 as a product of prime factors.

..... [2]

(b) Find the lowest common multiple (LCM) of 120 and 280.

..... [2]

2 Find an expression for the nth term of this sequence.

11, 15, 19, 23, 27, …

..... [2]

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3 There are 196 students in Year 11 in Maria's school.
43 of these students play a musical instrument.

(a) Write down the relative frequency of students who play a musical instrument in Year 11.

..... [1]

(b) There are a total of 1120 students in Maria's school.

Use your answer to **part (a)** to calculate an estimate for the number of students in Maria's school who play a musical instrument.

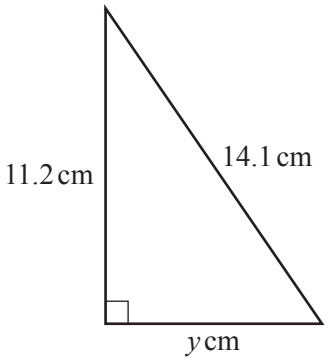
..... [2]

(c) Give a reason why your answer to **part (b)** may not be a good estimate.

.....

..... [1]

4



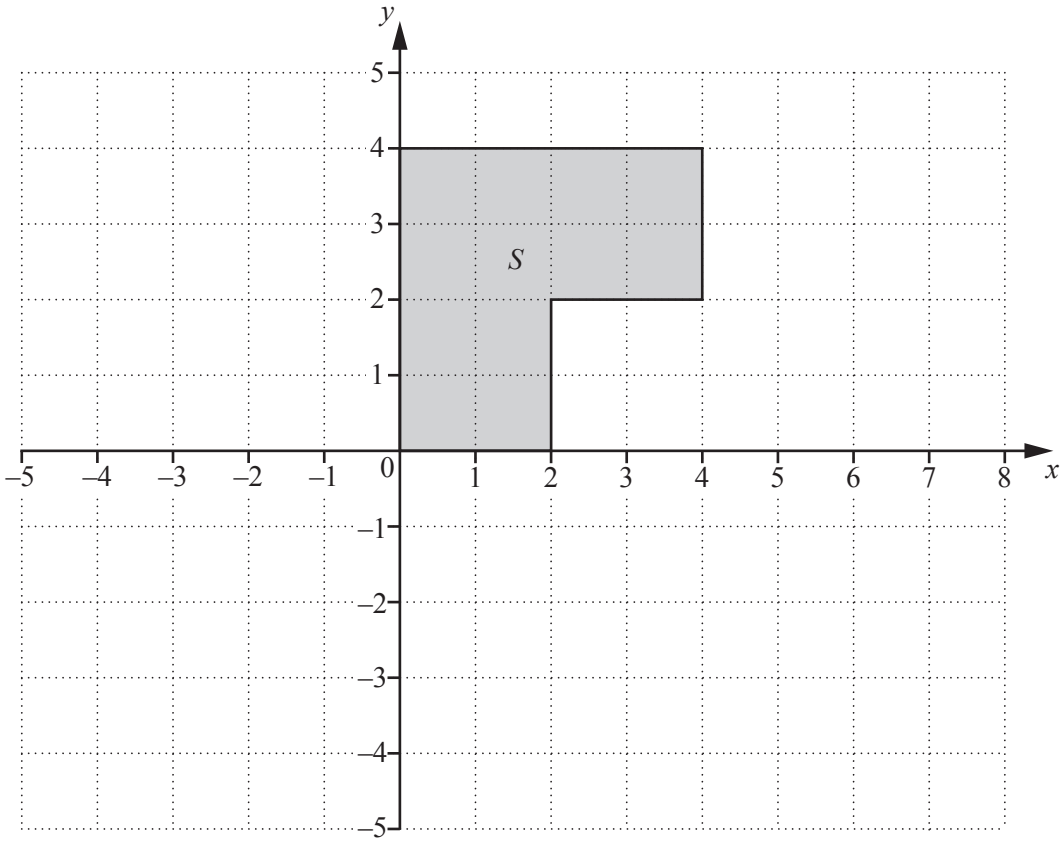
NOT TO SCALE

The diagram shows a right-angled triangle.

Calculate the value of y.

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

5



Draw the enlargement of shape S with scale factor $\frac{1}{2}$ and centre $(-4, 0)$. [2]

6 **(a)** Simplify $(m^3)^6$.

..... [1]

(b) $4x^3y^{-2} \times px^qy^r = 20x^{10}$

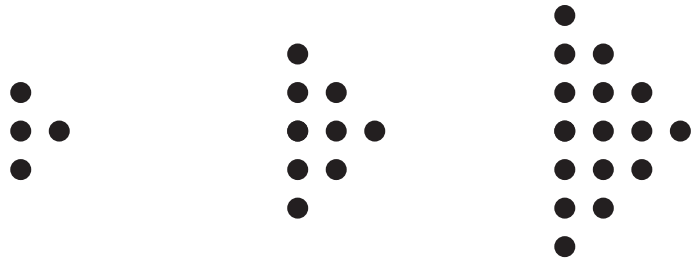
Find the values of p, q and r.

$p =$ .....

$q =$ .....

$r =$ ..... [3]

7 Here are the first three patterns in a sequence.



Pattern 1 Pattern 2 Pattern 3

(a) Find an expression for the number of dots in pattern n.

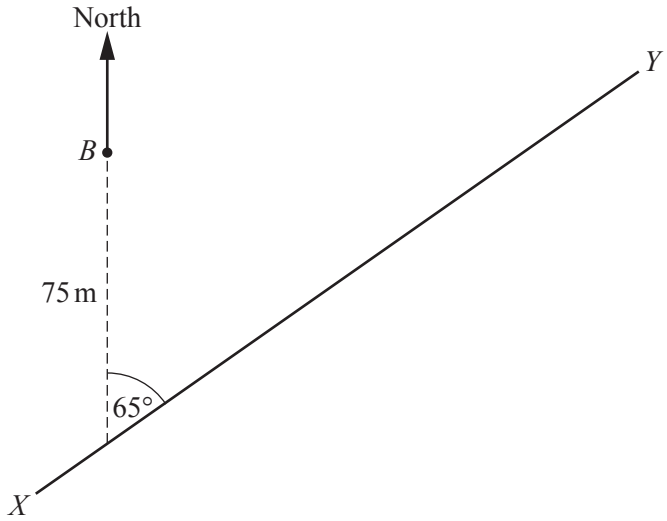
..... [3]

(b) Sajid has a box of 800 counters.
He uses these counters to make a pattern in this sequence.
He makes the largest possible pattern he can.

Which pattern number does he make?

..... [3]

8



NOT TO SCALE

The diagram shows the straight path of a swimmer from X to Y and the position of a fixed buoy, B.
The swimmer is moving on a bearing of 065°.
The swimmer passes 75 metres due south of B.

Calculate the shortest distance between the swimmer and B as he swims from X to Y.

..... m [3]

9 In a sale the price of a vacuum cleaner is reduced by 18%.
The sale price is £344.40 .

Calculate the price of the vacuum cleaner before the sale.

£ ..... [3]

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10 **(a)** Factorise $4x^2 - 9$.

..... [1]

(b) Simplify $\dfrac{4x^2 - 9}{2x^2 + 7x - 15}$.

..... [3]

11 The table shows how the 208 students in Robert's year group travel to school.

Transport	Frequency
Car	42
Walk	36
Bicycle	23
Bus	107

Robert wants to take a stratified sample of 20 students from his year group.

Complete the table below.

Transport	Number of students in sample
Car	
Walk	
Bicycle	
Bus	
Total	20

[3]

12 **(a)** Work out $\begin{pmatrix} 3 & -4 \\ 11 & 6 \end{pmatrix} + \begin{pmatrix} -2 & 7 \\ 7 & -9 \end{pmatrix}$.

$\begin{pmatrix} & \\ & \end{pmatrix}$ [1]

(b) $\mathbf{A} = \begin{pmatrix} 3 & 2 \\ -1 & 0 \\ 2 & 5 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} -2 & 0 \\ 1 & 1 \\ 3 & 0 \end{pmatrix}$ $\mathbf{C} = \begin{pmatrix} 0 & 1 & -1 \\ 1 & 0 & 3 \end{pmatrix}$

Alfie is asked to work out $\mathbf{A} \times \mathbf{B}$, $\mathbf{A} \times \mathbf{C}$, $\mathbf{A} + \mathbf{B}$ and $\mathbf{A} + \mathbf{C}$.
Alfie says that two of these calculations are not possible.

Which calculations are not possible?
Give a reason for each.

..... is not possible because .....

.....

..... is not possible because .....

..... [3]

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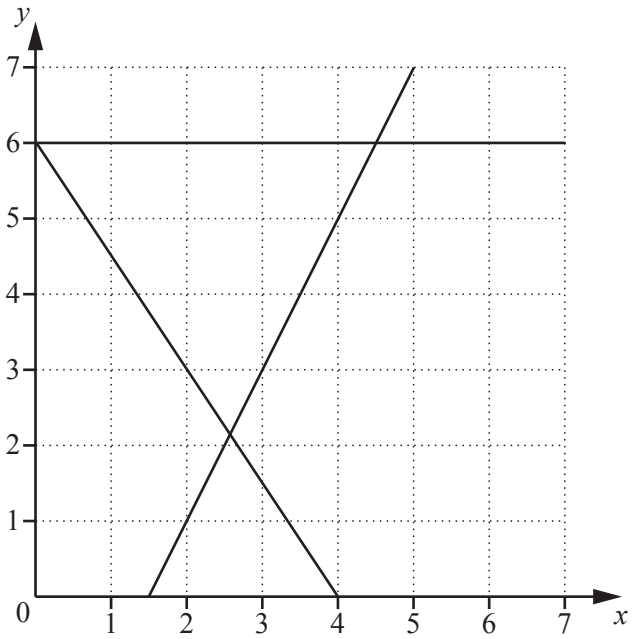
13 On 1st January 2010, Erica invested £4000 in an account that pays compound interest at a rate of 2% per year.
On 1st January 2015, William invested £4500 in an account that pays compound interest at a rate of x% per year.
On 1st January 2020, William's investment will be worth the same as Erica's investment.

Find the value of x, correct to one decimal place.

$x =$ ..... [5]

14



The diagram shows the graphs of $y = 2x - 3$, $3x + 2y = 12$ and $y = 6$.

The region R satisfies these three inequalities.

$$y \leqslant 6$$
$$y \geqslant 2x - 3$$
$$3x + 2y \geqslant 12$$

The region R contains the point (a, b) where a and b are both integers.

Find the value of a and the value of b that give the maximum value of $5a - 2b$.

$a =$ .....

$b =$ ..... [4]

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15 $f(x) = x^3 - x - 2$

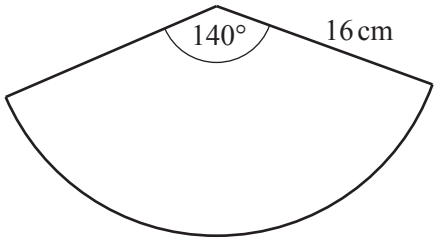
The iteration formula $u_{n+1} = \sqrt{\frac{2}{u_n} + 1}$ can be used to find a solution of $f(x) = 0$.

Starting with $u_1 = 2$, find this solution correct to 3 significant figures.
Write down the result of each of your iterations.

..... [3]

Question 16 is printed on the next page.

16



NOT TO SCALE

The diagram shows a sector of a circle with radius 16 cm and sector angle 140°.

(a) Calculate the area of the sector.

.....cm^2 [2]

(b) The isoperimetric quotient is used to measure how much like a circle a shape is.

This is how to calculate the isoperimetric quotient.

Divide the area of a shape by the area of the circle that has the same perimeter as this shape.

Show that the isoperimetric quotient of the sector above is 0.78 correct to 2 significant figures.

[4]

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