

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 a pencil for any diagrams or graphs.Do not use staples, paper clips, highlighters, glue or correction fluid.DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.

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

Electronic calculators should be used.

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 70.

This document consists of 12 printed pages.



[Turn over

2	M
	maths
For the diagram, write down	
(a) the order of rotational symmetry,	
(b) the number of lines of symmetry.	[1]
Answer(b)	[1]
Work out the number of students who have visited Australia but not Botswana.	[2]
Rearrange the formula $J = mv - mu$ to make <i>m</i> the subject.	



7 $\overrightarrow{AB} = \mathbf{a} + t\mathbf{b}$ and $\overrightarrow{CD} = \mathbf{a} + (3t-5)\mathbf{b}$ where t is a number.

Find the value of t when $\overrightarrow{AB} = \overrightarrow{CD}$.

Answer t = [2]

8 Show that $\frac{7}{27} + 1\frac{7}{9} = 2\frac{1}{27}$.

Write down all the steps in your working.

Answer

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9 When a car wheel turns once, the car travels 120 cm, correct to the nearest centimetre.

Calculate the lower and upper bounds for the distance travelled by the car when the wheel turns 20 times.

Answer lower bound cm

upper bound cm [2]



NOT TO SCALE

The pentagon has three angles which are each 140°. The other two interior angles are equal. Calculate the size of one of these angles.

Answer [3]

11 The resistance, R, of an object being towed through the water varies directly as the square of the speed, v.

R = 50 when v = 10.

Find *R* when v = 16.

Answer R = [3]

12 Write as a single fraction, in its simplest form.

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

Answer

[3]

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NOT TO SCALE

The diagram shows a circle of radius 5cm in a square of side 18cm.

Calculate the shaded area.

Answer cm^2 [3]

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14



Draw, accurately, the locus of all the points **outside** the triangle which are 3 centimetres away from the triangle. [3]







(b) Label the region R which satisfies the three inequalities

$x + y \ge 6$,	$y \ge 2$	and	$y \leq 2x.$	[1]
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20

21 An animal starts from rest and accelerates to its top speed in 7 seconds. It continues at this speed 9 seconds and then slows to a stop in a further 4 seconds.

The graph shows this information.



Question 22 is printed on the next page.

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