



General Certificate of Secondary Education
November 2024

Centre Number

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Candidate Number

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Mathematics

Unit M7 Paper 2
(With calculator)
Higher Tier



[GMC72]

GMC72

THURSDAY 21 NOVEMBER, 10.45am–12 NOON

TIME

1 hour 15 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page, on blank pages or tracing paper.

Complete in black ink only. **Do not write with a gel pen.**

Questions which require drawing or sketching should be completed using an HB pencil. All working **must** be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions.

You **may** use a calculator for this paper.

Answer **all seventeen** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 50.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

You should have a calculator, ruler, compasses and a protractor.

The Formula Sheet is on page 2.

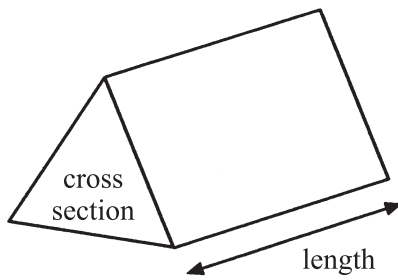
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Formula Sheet

Volume of prism = area of cross section \times length



Area of trapezium = $\frac{1}{2}(a+b)h$



Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

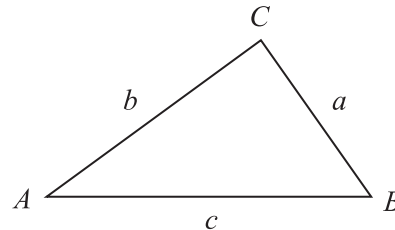


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



In any triangle ABC



Quadratic Equation

The solutions of $ax^2 + bx + c = 0$
where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Sine Rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

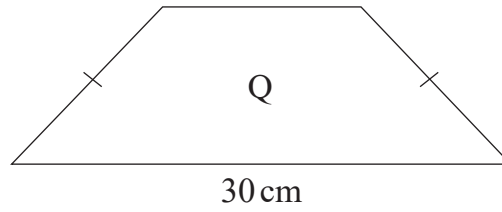
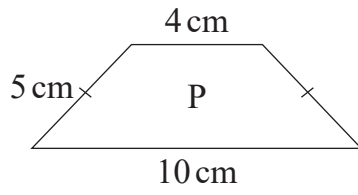
Cosine Rule: $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2} ab \sin C$



1

diagrams not
drawn accurately



Shape P is enlarged to give shape Q.

Work out the perimeter of shape Q.

Answer _____ cm [3]



2 A 1200 ml tub of ice-cream costs £5.00

An 800 ml tub of ice-cream costs £3.60

Which is better value?

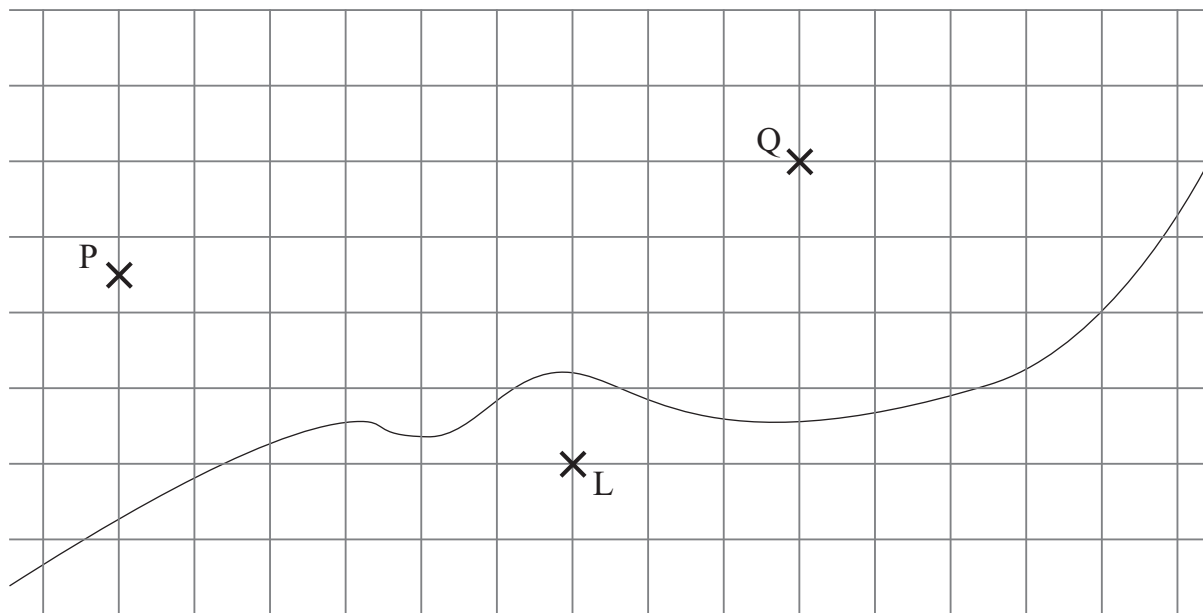
Show your working out clearly.

Answer _____ [3]



3 The diagram shows the position of two ships P and Q and a lighthouse L.

The scale is 1 cm represents 20 km.



Which ship is closer to L and how much closer is it?

Show your working out clearly.

Answer _____ is closer by _____ km [3]

[Turn over



4 Dylan wants to calculate his car's fuel consumption.

(a) He travels 180 miles and uses 24 litres.

Calculate his car's number of miles per litre.

Answer _____ miles per litre [1]

He wants to work out the number of miles per gallon.

1 gallon = 4.54 litres

(b) Calculate his car's number of miles per gallon.

Answer _____ miles per gallon [2]



5 Izzy's uncle sent her **four** 200 rand banknotes for her birthday.

$$£1 = 20.806 \text{ rand}$$

(a) Izzy **estimates** in her head how much she will get for her four notes.

How much does she estimate?

Show your working out clearly.

Answer £ _____ [1]

(b) How much **less** does Izzy get when the exact exchange rate is used?

Show your working out clearly.

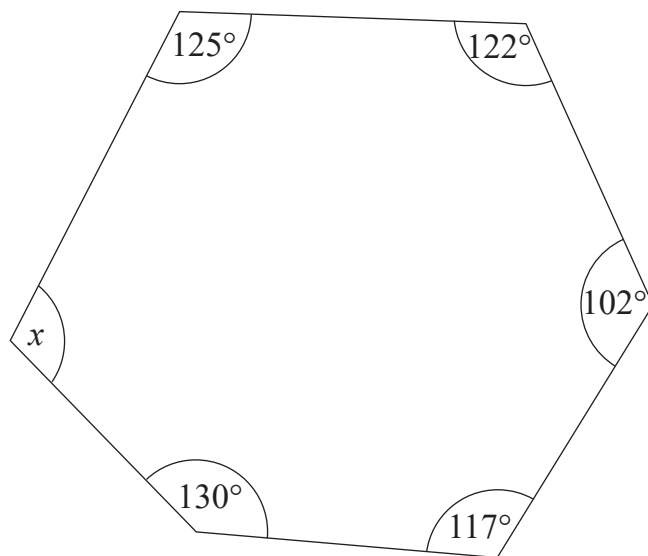
Answer £ _____ [2]

[Turn over



6 Work out the size of angle x in the hexagon.

diagram not
drawn accurately



Answer $x =$ _____ $^\circ$ [4]



7 A spinner is spun once.

It lands on A, B, C or D.

The probability of it landing on C and D is shown in the table.

The probability of it landing on A is the same as the probability of it landing on B.

Landing on	A	B	C	D
Probability			$\frac{1}{2}$	$\frac{3}{10}$

Work out the missing probabilities for A and B.

Write your answers in the table.

[3]

[Turn over



8 Jill has ten 50 pence coins and eight 20 pence coins.

Jack also has 50 pence coins and 20 pence coins.

Jack has the same total number of coins as Jill, but his coins are worth £2.10 less.

How many 20 pence coins does Jack have?

Answer _____ 20 pence coins [3]



9 The ingredients to make eight biscuits are:

Flour 160 g

Sugar 50 g

Butter 100 g

Pauline has 700 g of flour, 150 g of sugar and 520 g of butter.

How many grams of butter has she **left over** if she makes the **largest** number of biscuits she can?

Answer _____ g [4]

[Turn over



10 There are 55 girls and 20 boys in Year 13

The probability that a girl in Year 13 has a part-time job is $\frac{2}{5}$

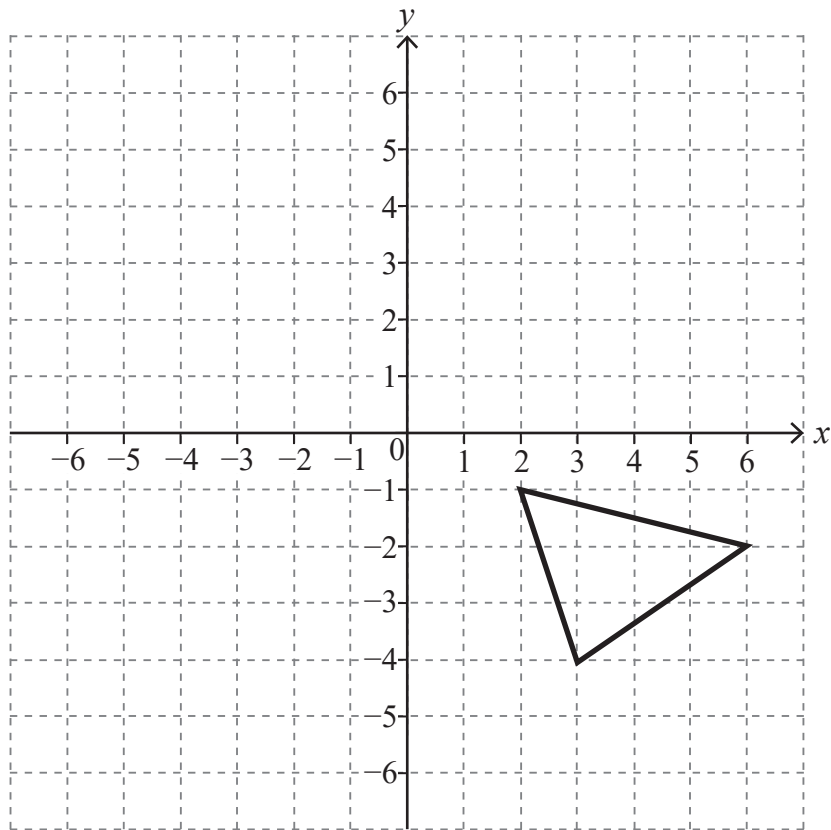
The probability that a boy in Year 13 has a part-time job is $\frac{3}{4}$

Work out the probability that a student in Year 13 has a part-time job.

Answer _____ [4]



11 Rotate the triangle 180° about the point $(3,1)$



[2]

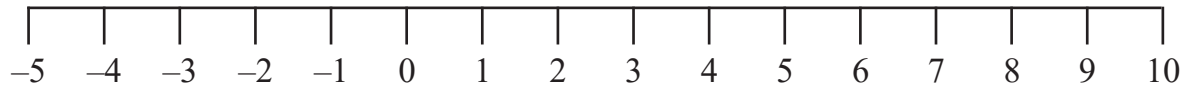
[Turn over



13 Solve the inequality

$$-5 < 2n \leq 8$$

showing all possible **integer** values for n on the number line below.



[2]

14 Fill in the blank below.

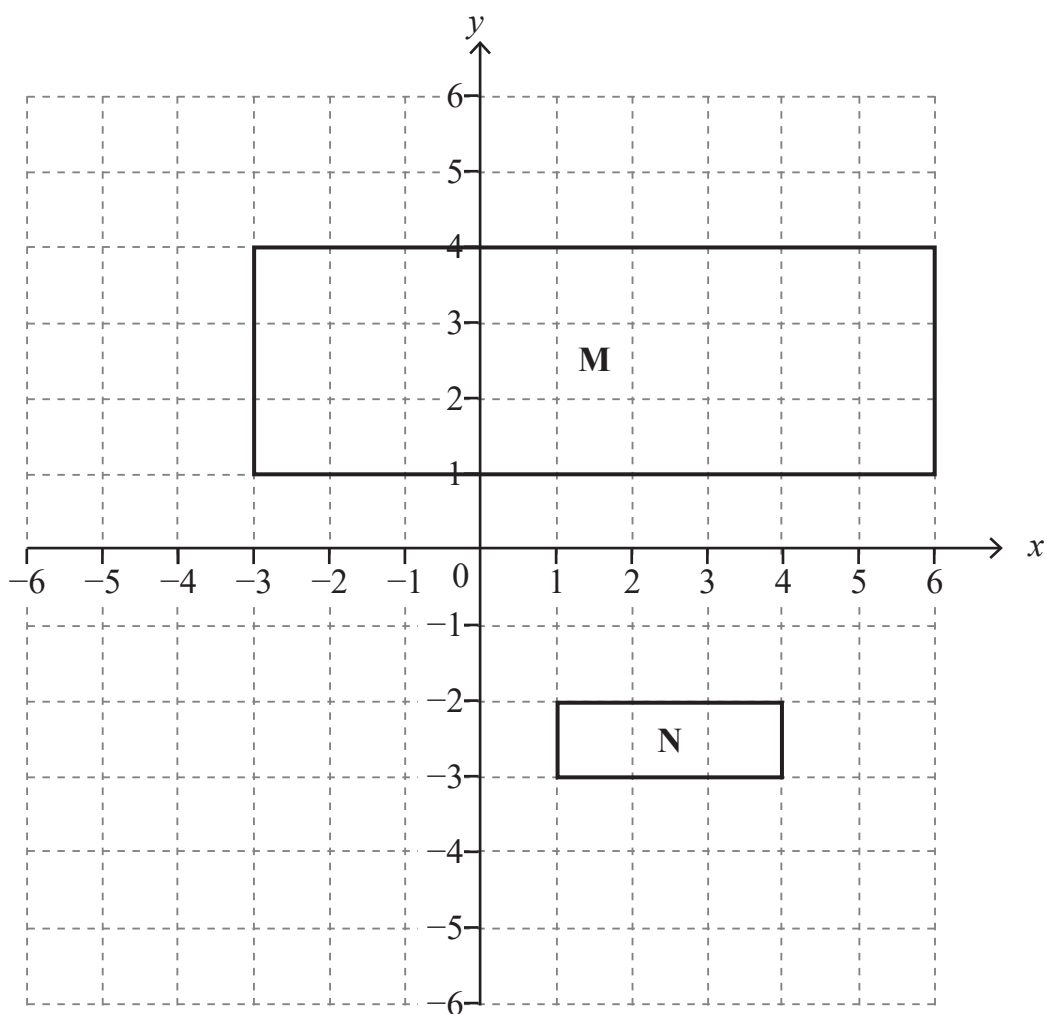
The dimensions of a large cylinder are twice the dimensions of a small cylinder.

The large cylinder will hold _____ times as much as the small cylinder. [1]

[Turn over



15 Describe fully the single transformation that maps **M** to **N**.



Answer _____

[3]



16 A restaurant has three courses on its menu

Starter

Soup
Brie
Prawns
Pâté

Main

Beef
Chicken
Salmon
Lasagne
Pork

Dessert

Apple tart
Pavlova
Lemon cake
Ice cream
Rhubarb crumble
Fruit salad

There is a special deal when any two courses are ordered.

How many options are there when **any two different** courses are ordered?

Answer _____ [3]



17 Find the n th term of the sequence

$$\frac{1}{2}, \frac{8}{3}, \frac{27}{4}, \frac{64}{5}, \frac{125}{6}, \dots$$

Answer _____ [2]

THIS IS THE END OF THE QUESTION PAPER





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Total Marks	
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Examiner Number

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