



General Certificate of Secondary Education
November 2025

Centre Number

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Candidate Number

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Mathematics

Unit M8 Paper 2
(With calculator)

Higher Tier



[GMC82]

GMC82

THURSDAY 20 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 twelve** 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.

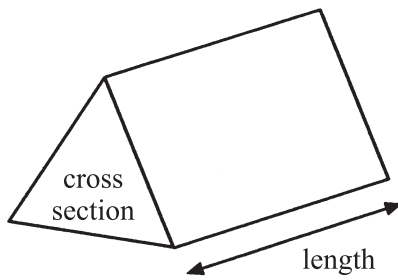
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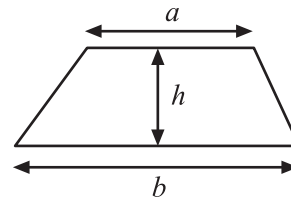
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Formula Sheet

Volume of prism = area of cross section \times length

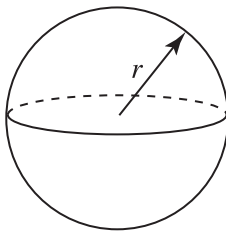


Area of trapezium = $\frac{1}{2}(a+b)h$



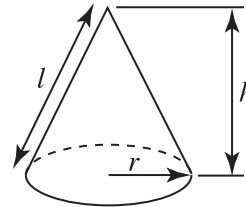
Volume of sphere = $\frac{4}{3}\pi r^3$

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

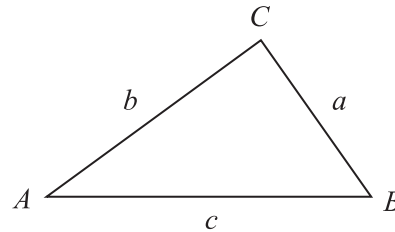


Volume of cone = $\frac{1}{3}\pi r^2 h$

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 Two regular pentagons are placed together.

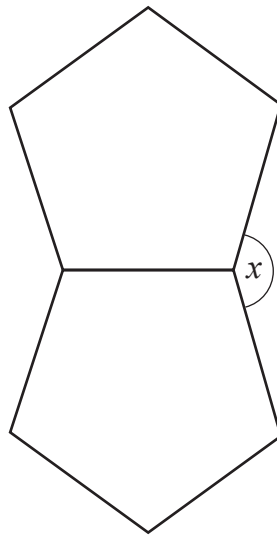


diagram not drawn accurately

Work out the size of angle x .

Answer _____ ° [4]

[Turn over



2 Simplify

(a) $(m^3)^4$

Answer _____ [1]

(b) $\frac{e^{15}}{e^3}$

Answer _____ [1]

3 Solve $4x - 1 < 2$

Answer _____ [2]

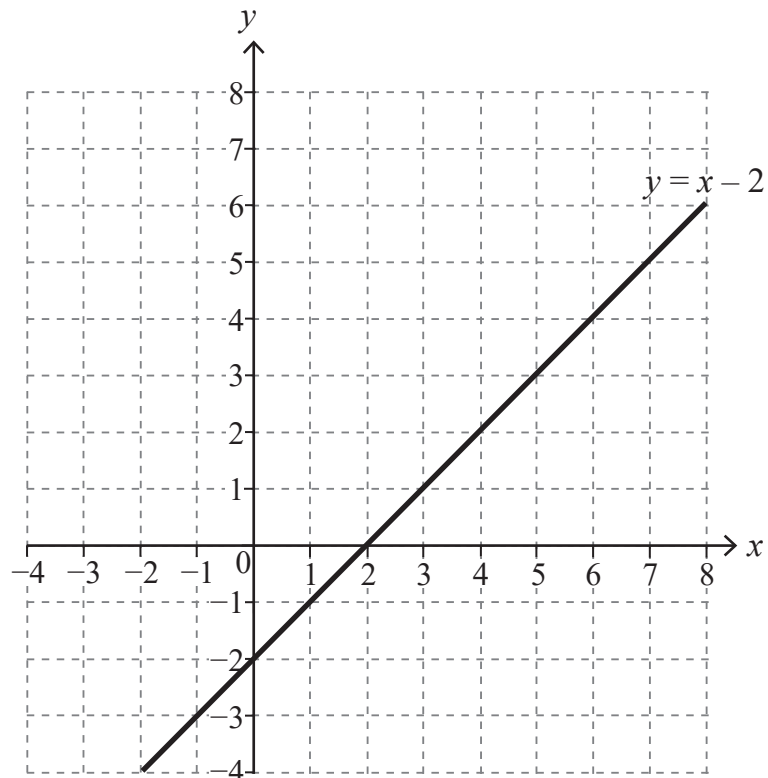


4 Grace is trying to solve the simultaneous equations

$$y = x - 2$$

$$y = 6 - x$$

Grace begins by drawing the line $y = x - 2$ as shown.



(a) Draw the other line needed to solve the simultaneous equations.

[2]

(b) Write down the solution to these simultaneous equations.

Answer $x =$ _____ $y =$ _____ [1]

[Turn over



5 Jack owns a shop.

He offers a special deal when a customer buys a drink, a sandwich and a cookie.

There are 9 different drinks and 6 different sandwiches to choose from.

There are 270 different combinations in this special deal.

How many different cookies are there to choose from?

Answer _____ [2]

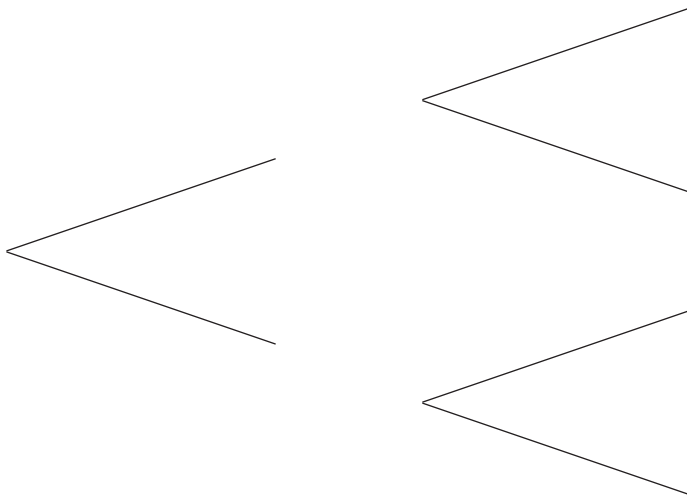


6 A dice is biased.

The probability of getting a six is $\frac{2}{9}$

The dice is rolled twice.

(a) Complete the tree diagram to show this information.



[2]

(b) What is the probability of getting no sixes?

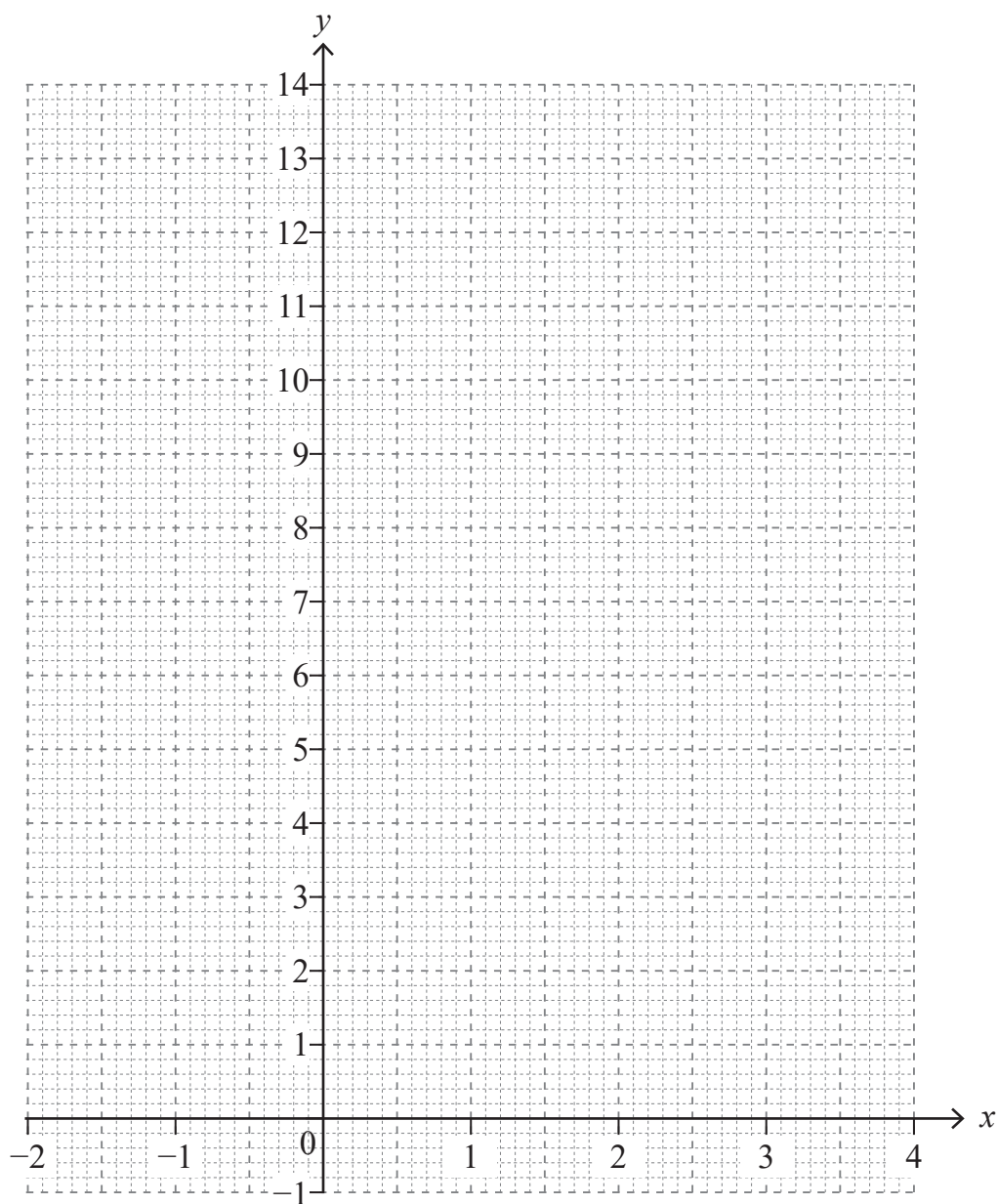
Answer _____ [2]

[Turn over



7 (a) Draw the graph of $y = x^2 - 3x + 2$ from $x = -2$ to $x = 4$

[3]



(b) Use your graph to estimate the value of y for $x = 2.6$

Answer _____ [1]

(c) Use your graph to estimate the minimum value of y .

Answer _____ [1]

(d) By drawing a suitable line on your graph, solve the equation $x^2 - 2x - 2 = 0$

Answer _____ [3]

[Turn over



8 A and B are similar shapes.

The area of A is 10 cm^2 and the area of B is 160 cm^2

The height of A is $x \text{ cm}$ and the height of B is $(x + 9) \text{ cm}$.

Work out the value of x .

Show your working out clearly.

Answer $x =$ _____ [4]



9 Tom plays a game of snooker and a game of pool.

The probability that Tom will win his game of snooker is 0.4

If Tom wins his game of snooker, the probability that he will win his game of pool is 0.3

If Tom does not win his game of snooker, the probability that he will win his game of pool is 0.2

(a) Draw a tree diagram for this information.

[2]

(b) Hence find the probability that Tom will win at least one of his two games.

Answer _____ [2]

[Turn over



10 The point $(6, 1)$ lies on the circumference of a circle, centre the origin.

(a) Find the equation of the circle.

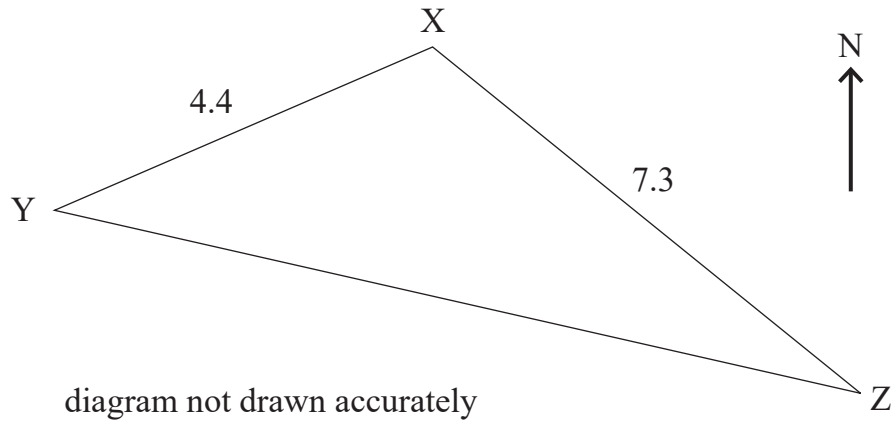
Answer _____ [2]

(b) Find the equation of the tangent to the circle at $(6, 1)$.

Answer _____ [3]



11



X is 4.4 km from Y and 7.3 km from Z.

The bearing of X from Y is 053°

Angle XZY is 27°

Find the bearing of Z from Y.

Answer _____ $^\circ$ [4]

[Turn over



12

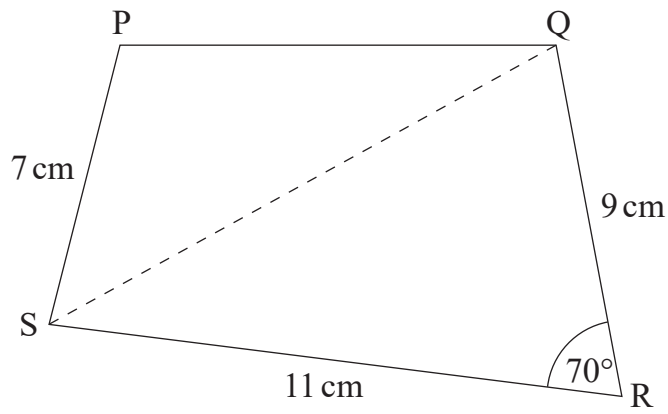


diagram not drawn accurately

PQRS has an area of 80 cm^2

Calculate the size of the angle PSQ.

Answer _____ ° [8]





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Question Number	Marks
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Total Marks	
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Examiner Number

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