

Mathematics — Paper 1

International Examinations Board · September 2026

GRADE 10 MATHEMATICS

Paper 1 — Written Examination

Time allowed: 1 hour 30 minutes

Total marks: 80

Name: _____

Candidate Number: _____

Class: _____

Instructions to Candidates

1. Write your name, candidate number and class in the spaces provided above.
2. Answer **all** questions in the spaces provided on this paper.
3. Show all necessary working. Marks may be awarded for correct method even when the final answer is incorrect.
4. Electronic calculators are permitted unless a question states otherwise.
5. Give non-exact answers correct to 3 significant figures, and angles correct to 1 decimal place.
6. Take $\pi = 3.142$, or use the π key on your calculator.
7. The mark for each question or part question is shown in brackets, for example [4].
8. The total for this paper is 80 marks.

Note

The marks shown are a guide to how much time you should spend on each question. Aim to spend about one minute per mark.

Section A — Algebra

Total: 18 marks

1.

(a) Expand and simplify $(2x - 3)(x + 5)$. **[2]**

(b) Factorize fully $3x^2 - 27$. **[2]**

(c) Simplify $\frac{x^2 - 9}{x^2 + 7x + 12}$. **[3]**

2. Solve the quadratic equation $2x^2 - 5x - 3 = 0$. **[3]**

3. Solve the simultaneous equations $3x + 2y = 16$ and $x - y = 3$. **[4]**

4.

(a) Make r the subject of the formula $V = \frac{4}{3}\pi r^3$. **[2]**

(b) Solve the inequality $5 - 2x \leq 11$, and represent your solution on a number line. **[2]**

Section B — Functions and Graphs

Total: 17 marks

5. The functions f and g are defined by $f(x) = 3x - 4$ and $g(x) = x^2 + 1$.

(a) Find $f(-2)$. **[1]**

(b) Find $fg(3)$. **[2]**

(c) Find $f^{-1}(x)$. **[3]**

6. A curve has equation $y = x^2 - 4x - 5$.

(a) Find the coordinates of the two points where the curve crosses the x -axis. **[2]**

(b) Write down the coordinates of the point where the curve crosses the y -axis. **[1]**

(c) Express $x^2 - 4x - 5$ in the form $(x - a)^2 + b$, and hence state the coordinates of the turning point. **[3]**

(d) Sketch the curve on the grid provided, labelling the intercepts and the turning point. **[2]**

7. A straight line passes through the points $A(-1, 2)$ and $B(3, 10)$.

(a) Find the gradient of AB . **[1]**

(b) Find the equation of the line AB , giving your answer in the form $y = mx + c$. **[2]**

Section C — Geometry and Mensuration

Total: 16 marks

8. P , Q and R are points on the circumference of a circle with center O . The reflex angle $POR = 232^\circ$.

(a) Find the size of angle PQR , giving a reason for your answer. **[2]**

(b) $PQRS$ is a cyclic quadrilateral in which angle $QRS = 97^\circ$. Find angle QPS , giving a reason for your answer. **[2]**

9. Triangles ABC and ADE are similar, with BC parallel to DE . Given that $AB = 6$ cm, $AD = 15$ cm and $BC = 8$ cm, calculate the length of DE . **[3]**

10. A solid cone has base radius 5 cm and vertical height 12 cm.

(a) Calculate the volume of the cone, using $V = \frac{1}{3}\pi r^2 h$. **[3]**

(b) Calculate the total surface area of the cone. **[3]**

11. A sector of a circle has radius 9 cm and sector angle 140° . Calculate the arc length and the area of the sector. **[3]**

Section D — Trigonometry

Total: 14 marks

12. In triangle ABC , angle $ABC = 90^\circ$, $AB = 7.4$ cm and $BC = 11.2$ cm.

(a) Calculate the length of AC . **[2]**

(b) Calculate the size of angle BAC . **[2]**

13. In triangle PQR , $PQ = 8.3$ cm, $QR = 12.6$ cm and angle $PQR = 68^\circ$.

(a) Use the cosine rule to calculate the length of PR . **[3]**

(b) Calculate the area of triangle PQR , using $\text{Area} = \frac{1}{2}ab\sin C$. **[2]**

14. A vertical mast TB stands on level ground. From a point A on the ground, 64 m from the foot B of the mast, the angle of elevation of the top T is 27° .

(a) Calculate the height of the mast. **[2]**

(b) A second point C lies on the ground due east of B , and the angle of elevation of T from C is 41° . Calculate the distance BC . **[3]**

Section E — Data Handling

Total: 15 marks

15. The table shows the time, t minutes, taken by 50 students to travel to school one morning.

Time taken, t minutes	Frequency
$0 < t \leq 10$	4
$10 < t \leq 20$	9
$20 < t \leq 30$	15
$30 < t \leq 40$	12
$40 < t \leq 50$	7
$50 < t \leq 60$	3
Total	50

(a) Write down the modal class. **[1]**

(b) Calculate an estimate of the mean time taken. **[4]**

(c) Write down the class interval that contains the median, and explain how you decided. **[2]**

16. One of the 50 students is chosen at random. Find the probability that this student took more than 40 minutes to travel to school. Give your answer as a fraction in its simplest form. **[2]**

17. A scatter diagram is drawn showing the distance each student lives from school against the time taken to travel there.

(a) Describe the type of correlation you would expect. **[1]**

(b) A line of best fit is drawn. Explain how it could be used to estimate the travel time for a student living 3.5 km from school, and state one limitation of this estimate. **[2]**

18. The mean mass of 8 parcels is 12.5 kg. A ninth parcel of mass 17 kg is added to the group. Calculate the mean mass of all 9 parcels. **[3]**

Mark Allocation Summary

Section	Topic	Marks
A	Algebra	18
B	Functions and Graphs	17
C	Geometry and Mensuration	16
D	Trigonometry	14
E	Data Handling	15
	Total	80

END OF EXAMINATION PAPER

Check your work carefully before handing in your paper.