

# E2.10 Graphs of functions

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Total: 11 marks

## Objective

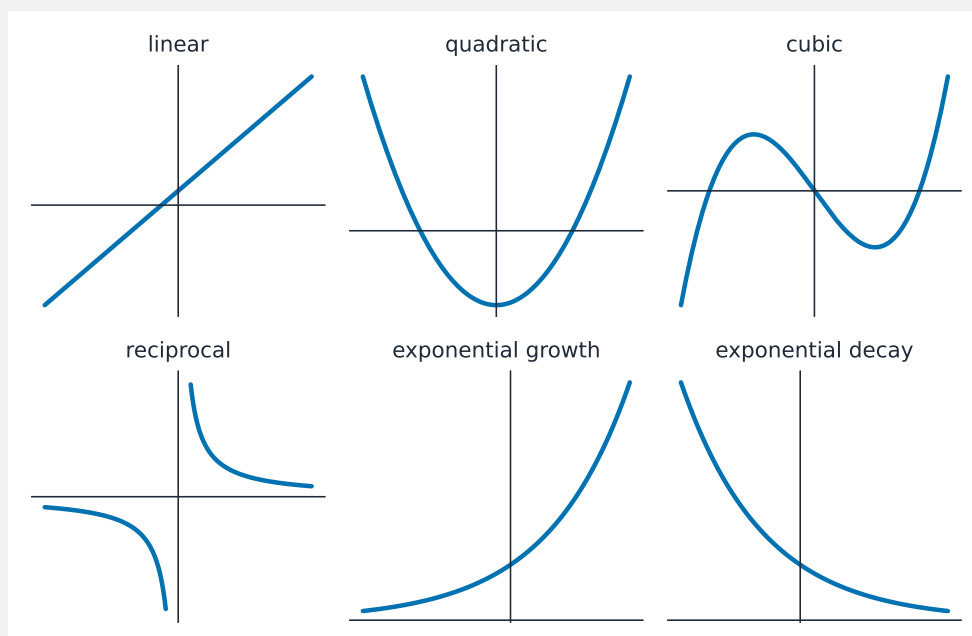
Build the skills to answer Extended exam questions on **graphs of functions** 函数图象—making a **table of values** 数值表, finding **roots** 根 (where the graph crosses the  $x$ -axis), and reading solutions from a graph.

**You must be able to:**

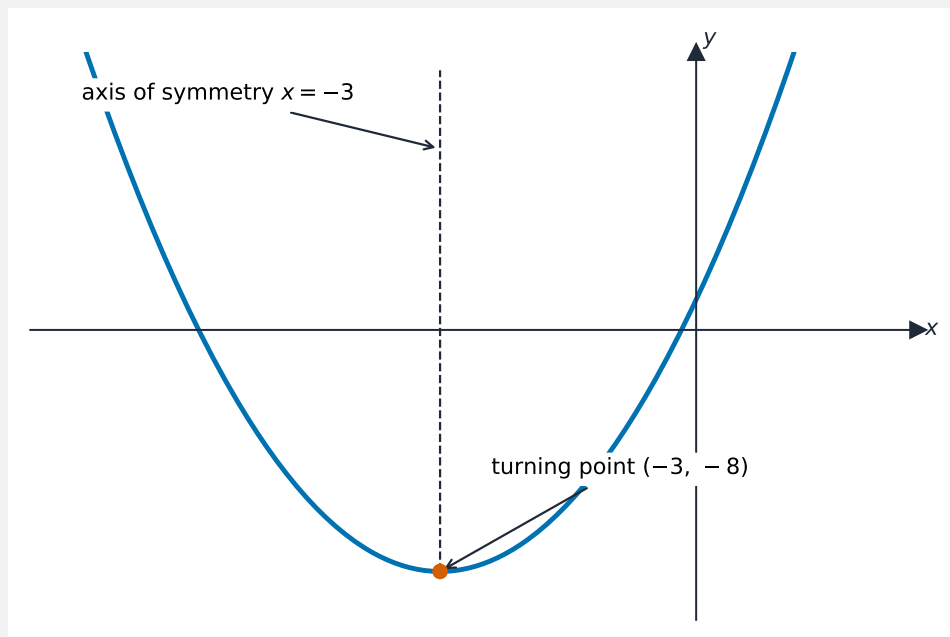
- complete a table of values for a function
- identify the roots and the  $y$ -intercept of a graph
- use a graph to solve an equation

## 1 Worked examples

### ■ Tables, roots and intersections



*Plot points from a table, then join with a smooth curve*



*The quadratic is one key function graph*

- **Table:** for  $y = x^2 - 3$ , when  $x = 2$ ,  $y = 4 - 3 = 1$ .
- **Roots** 根: where  $y = 0$  (the graph crosses the  $x$ -axis).
- **Solve from a graph:** the **intersection** 交点 of a line and a curve solves the two together.

**Answer shapes:** **M1** a correct method, **A1** the correct answer.

## 2 Practice

**2.1** For  $y = x^2 - 4$ , find the value of  $y$  when  $x = 3$ . [1]

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**2.2** Write down the  $y$ -intercept of  $y = 2x^2 - 5$ . [1]

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**2.3** Find the roots of  $y = x^2 - 9$ . [2]

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## 3 Exam-style questions

**3.1**  $y = x^2 - 2x - 3$ .

(a) Complete the value of  $y$  when  $x = -2$ . [1]

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(b) Find the roots of  $x^2 - 2x - 3 = 0$ . [2]

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**3.2** The graph of  $y = x^2 - 2x - 3$  is drawn. By solving a quadratic, find the  $x$ -values where the graph meets the line  $y = 5$ . [3]

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## 4 Go further

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You are now ready for the real exam questions on this subtopic. Open the **E2.10 Graphs of functions** past-paper sheet in the Library, or try these in **Practice mode**:

- 0580/42 N25 —Q11 (graphs of functions)
- 0580/22 J25 —Q15 (reading a graph)

## Solutions

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Marking: **M1** a correct method, **A1** the correct answer.

**2.1**  $y = 3^2 - 4 = 5$ .

**2.2** the  $y$ -intercept is at  $x = 0$ :  $y = -5$ .

**2.3**  $x^2 - 9 = 0 \rightarrow (x + 3)(x - 3) = 0 \rightarrow x = 3$  or  $x = -3$ .

**3.1** (a)  $y = (-2)^2 - 2(-2) - 3 = 4 + 4 - 3 = 5$ . (b)  $(x - 3)(x + 1) = 0 \rightarrow x = 3$  or  $x = -1$ .

**3.2** set  $x^2 - 2x - 3 = 5 \rightarrow x^2 - 2x - 8 = 0 \rightarrow (x - 4)(x + 2) = 0 \rightarrow x = 4$  or  $x = -2$ .