

Question Examples from Advance Information for Paper 2 (EdExcel)

Formal Proof - see practice questions for paper 1

The modulus of a linear function

Solve $|5x - 2| = -\frac{1}{4}x + 8$. (4 marks)

- a On the same set of axes, sketch $y = |12 - 5x|$ and $y = -2x + 3$. (3 marks)
- b State with a reason whether there are any solutions to the equation $|12 - 5x| = -2x + 3$ (2 marks)

The function f is defined by

$$f: x \rightarrow |3x - a|, x \in \mathbb{R}.$$

where a is a positive constant.

- a Find $ff(-2a)$. (2)
- b Sketch the graph $y = f(x)$, showing the coordinates of any points where the graph meets the coordinate axes. (3)
- c Solve the equation $f(x) = x$, giving your answers in terms of a . (3)
- a Sketch on the same set of axes the graphs of $y = |x|$ and $y = |2x - 3|$. (3)
- b Hence, or otherwise, solve the equation $|x| = |2x - 3|$. (4)

(a) Sketch and label on the same set of axes the graphs of:

(i) $y = |x|$; (1 mark)

(ii) $y = |2x - 4|$. (2 marks)

(b) (i) Solve the equation $|x| = |2x - 4|$. (3 marks)

(ii) Hence, or otherwise, solve the inequality $|x| > |2x - 4|$. (2 marks)

(a) Sketch the graph of $y = |2x|$. (1 mark)

(b) On a separate diagram, sketch the graph of $y = 4 - |2x|$, indicating the coordinates of the points where the graph crosses the coordinate axes. (3 marks)

(c) Solve $4 - |2x| = x$. (3 marks)

(d) Hence, or otherwise, solve the inequality $4 - |2x| > x$. (2 marks)

Understand and use function notation

$$f : x \rightarrow 2 + \log_4 x, \quad x \in \mathbb{R}, \quad x > 0.$$

- a** Evaluate $ff(1)$. (3)
- b** Solve the equation $f(x) = 0$. (2)
- c** Find the inverse function $f^{-1}(x)$. (3)

The function f is defined by

$$f : x \rightarrow \frac{x+2}{x-1}, \quad x \in \mathbb{R}, \quad x \neq 1.$$

- a** Show that $ff(x) = x$ for all $x \in \mathbb{R}, x \neq 1$. (3)
- b** Hence, write down an expression for $f^{-1}(x)$. (1)

The function g is defined by

$$g : x \rightarrow 2x - 3, \quad x \in \mathbb{R}.$$

- c** Solve the equation $gf(x) = 0$. (4)

The function $f(x)$ is defined for all real values of x by

$$f(x) = x + 2, \quad x < 1,$$

$$f(x) = 4 - x^2, \quad x \geq 1.$$

- a** Sketch the graph of $f(x)$ showing the coordinates of any points of intersection with the coordinate axes. (4)
- b** Evaluate $ff(3)$. (2)
- c** Solve the equation $f(x) = 1$. (4)