

Piecewise Functions

Revise this topic →



← Check your work

This booklet features original exam style questions designed by me. They do not feature in past papers but are good practice for your exams.

The content is designed to reflect the style of the **AQA Level 2 Certificate in Further Maths**.
It may not be suitable for other courses.



Answer **all** questions in the spaces provided.

Do not write
outside the
box

1 A function f is given by

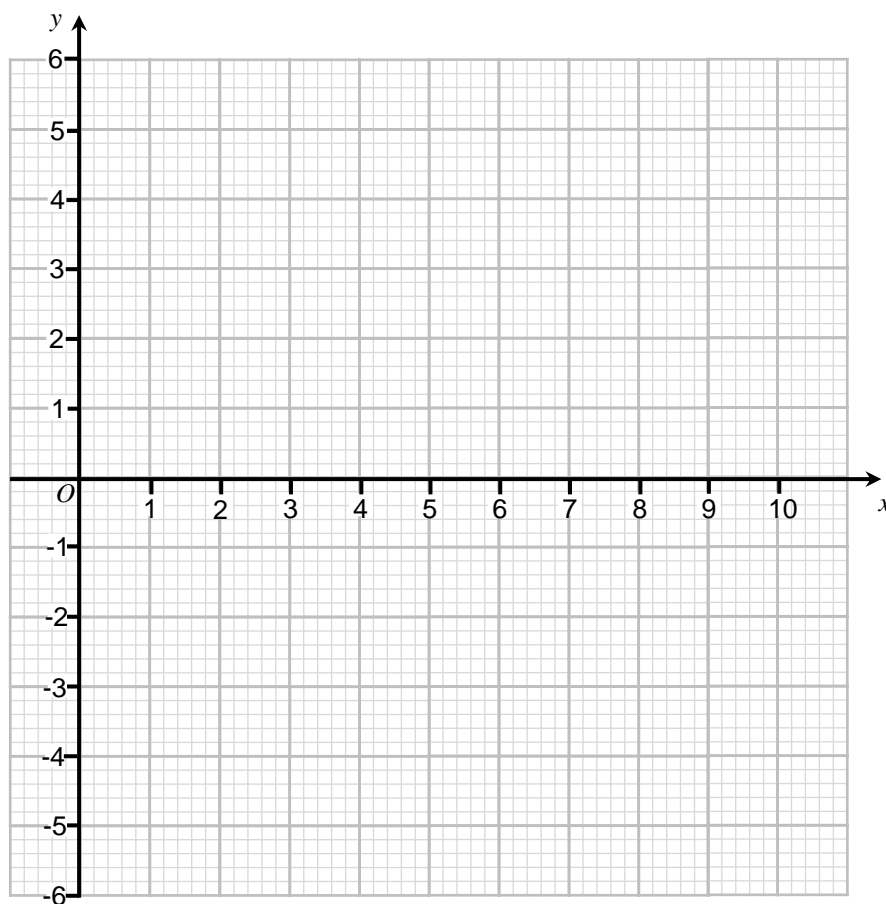
$$f(x) = 2x - 3 \quad 0 \leq x < 3$$

$$= 6 - x \quad 3 \leq x < 7$$

$$= -1 \quad 7 \leq x \leq 10$$

Draw a sketch of $y = f(x)$ for values of x from 0 to 10.

[4 marks]





2 A function f is given by

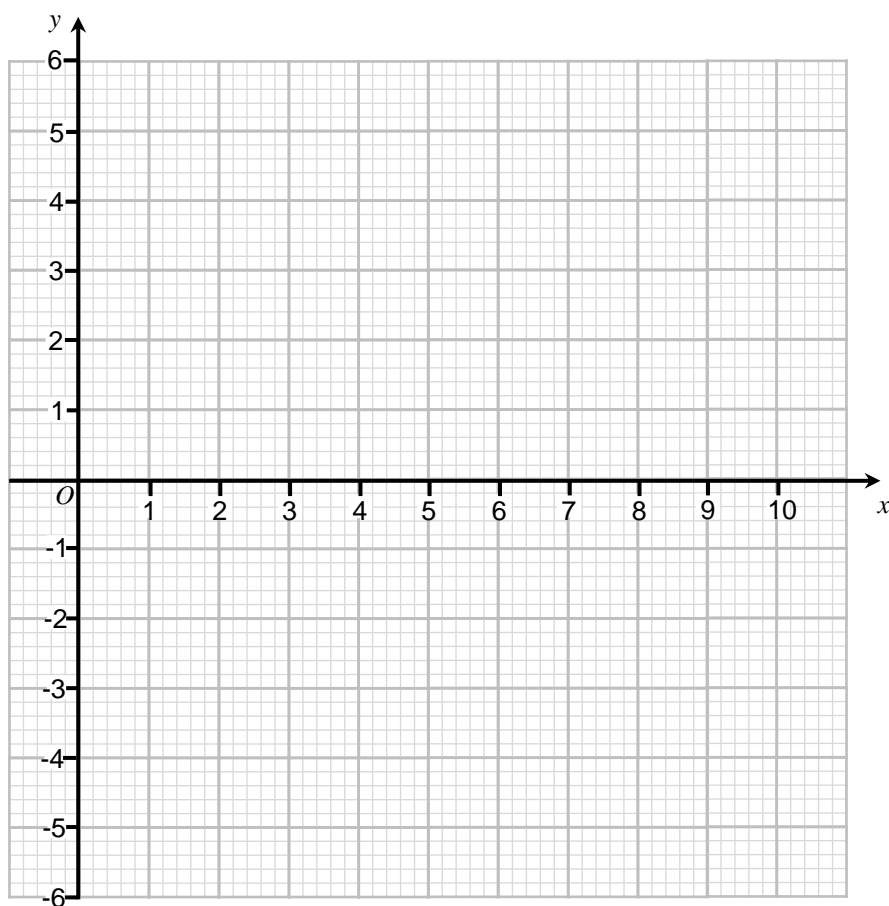
$$f(x) = 5 - 0.5x \quad 0 \leq x < 4$$

$$= -4x + 19 \quad 4 \leq x < 6$$

$$= x - 11 \quad 6 \leq x \leq 10$$

Draw a sketch of $y = f(x)$ for values of x from 0 to 10.

[4 marks]



$\frac{\quad}{8}$

Turn over ►





3 A function f is given by

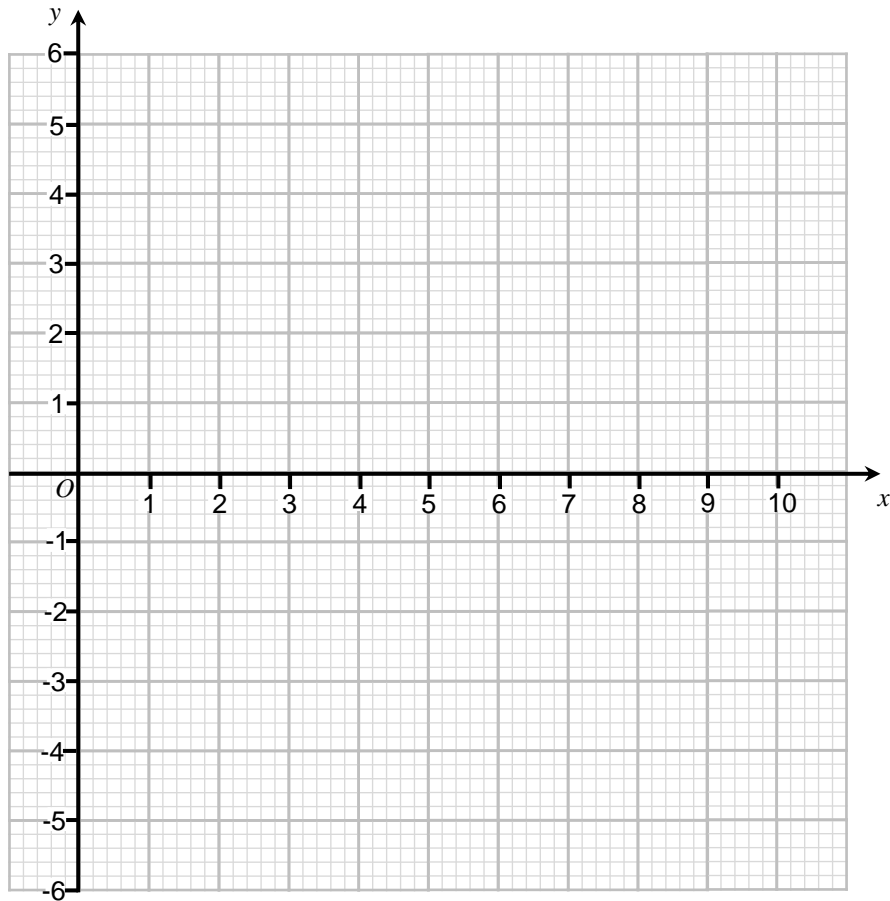
$$f(x) = x^2 \quad 0 \leq x < 2$$

$$= 6 - x \quad 2 \leq x < 4$$

$$= 4 - 0.5x \quad 4 \leq x \leq 10$$

Draw a sketch of $y = f(x)$ for values of x from 0 to 10.

[4 marks]



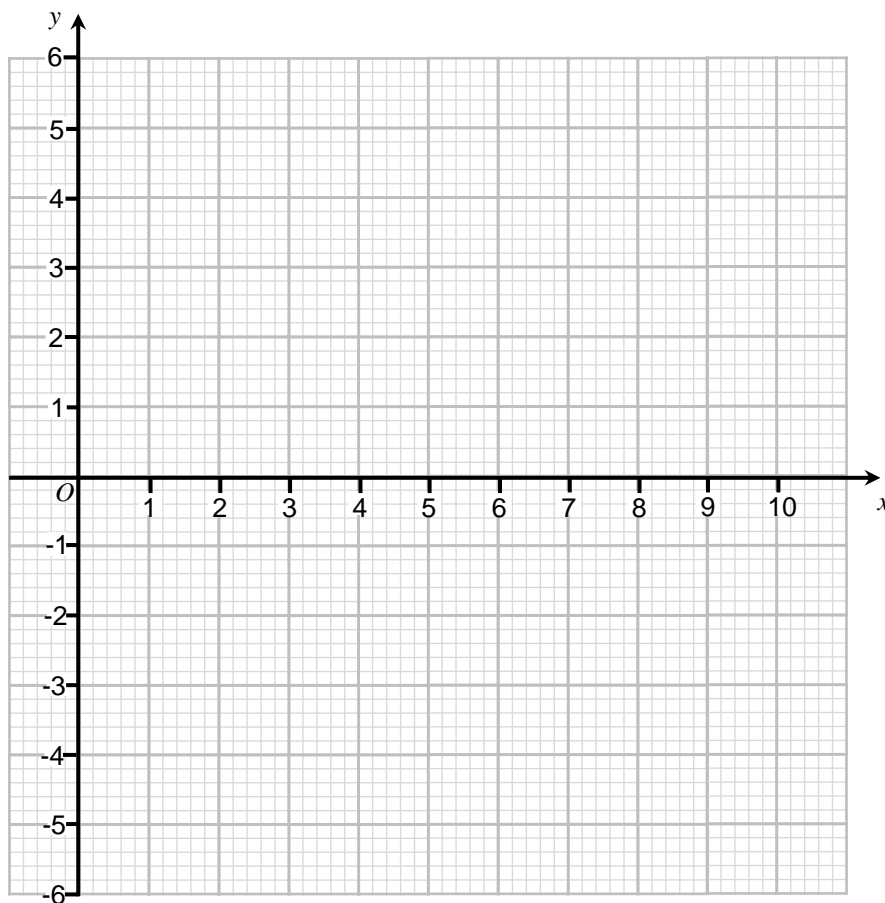


4 A function f is given by

$$\begin{aligned} f(x) &= 5 - x^2 & 0 \leq x < 3 \\ &= 3x - 13 & 3 \leq x < 6 \\ &= 5 & 6 \leq x \leq 10 \end{aligned}$$

Draw a sketch of $y = f(x)$ for values of x from 0 to 10.

[4 marks]



$\frac{1}{8}$

Turn over ►



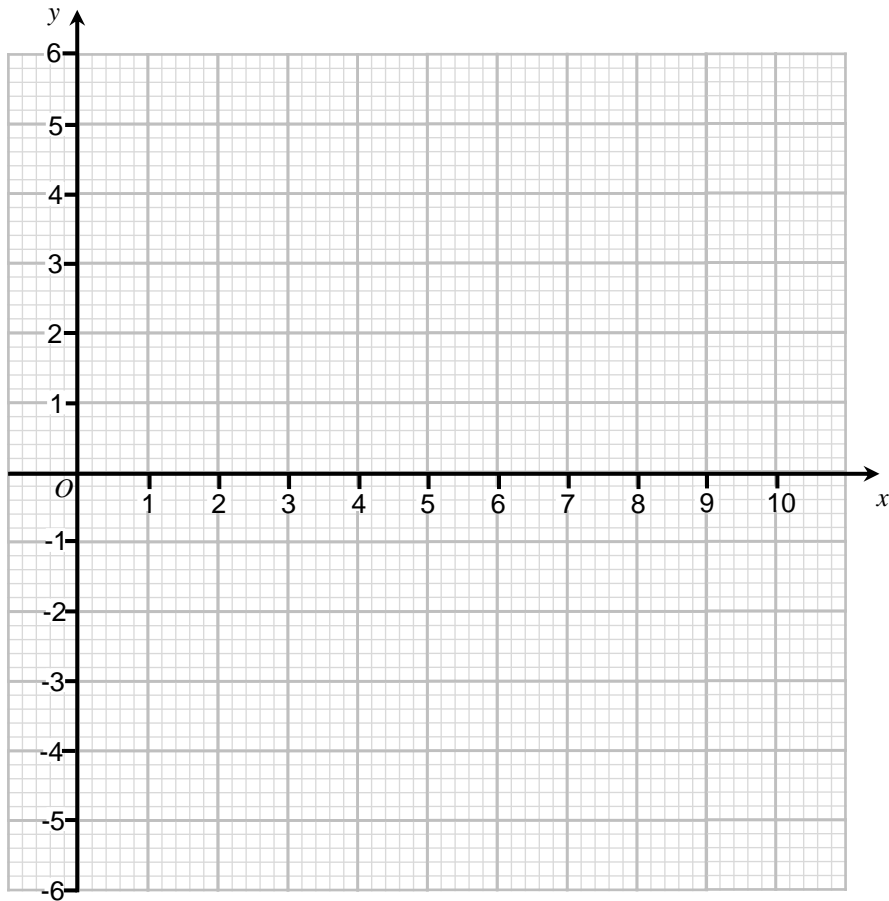


5 A function f is given by

$$\begin{aligned} f(x) &= x + 2 & 0 \leq x < 3 \\ &= x^2 - 12x + 32 & 3 \leq x < 8 \\ &= 12 - \frac{3}{2}x & 8 \leq x \leq 10 \end{aligned}$$

Draw a sketch of $y = f(x)$ for values of x from 0 to 10.

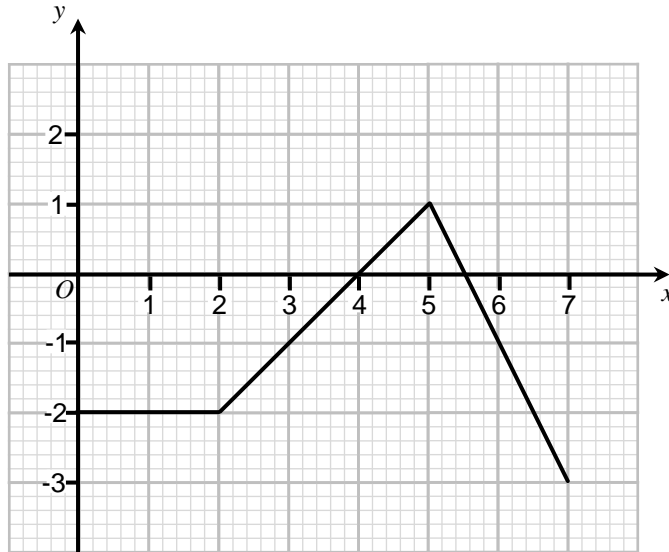
[4 marks]





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6 Here is a graph of $y = f(x)$



Define $f(x)$, stating clearly the domain for each part.

[3 marks]

$f(x) =$ _____ $\leq x <$ _____

_____ $\leq x <$ _____

_____ $\leq x \leq$ _____

7

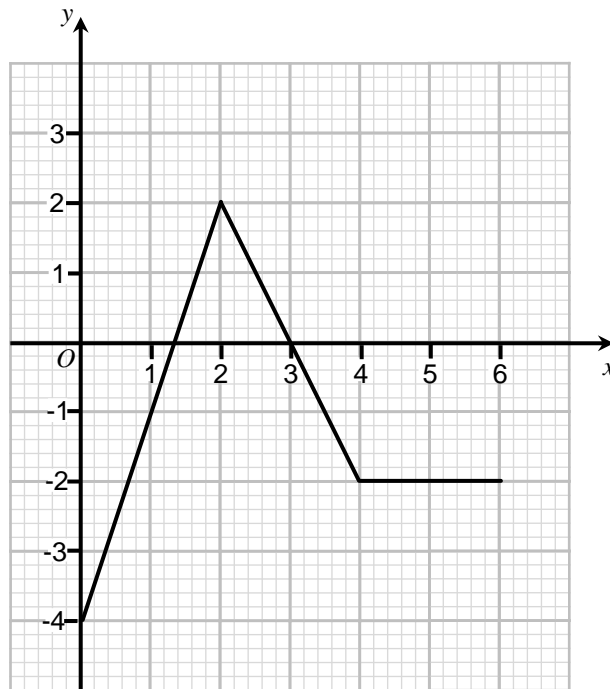
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7 Here is a graph of $y = f(x)$



Define $f(x)$, stating clearly the domain for each part.

[3 marks]

$f(x) =$ _____ $\leq x <$ _____
 _____ $\leq x <$ _____
 _____ $\leq x \leq$ _____



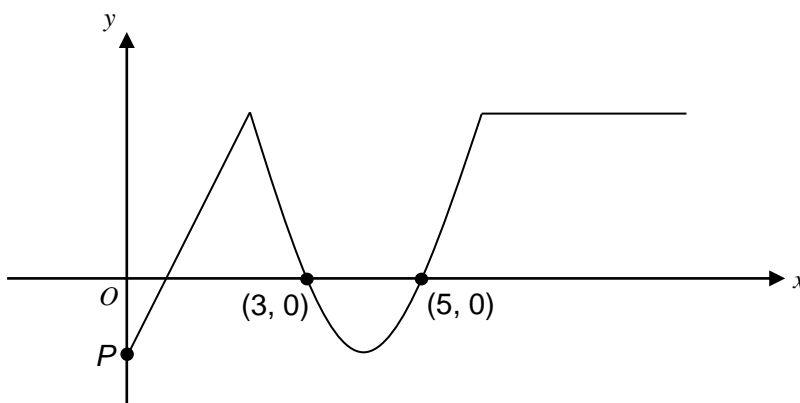


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8 $f(x) = ax + b \quad 0 \leq x < 2$
 $= (x - c)(x - d) \quad 2 \leq x < 6$
 $= e \quad 6 \leq x \leq 10$

a, b, c, d and e are constants with $c < d$

A sketch of $y = f(x)$ is shown.



The point P is where the function intersects the y -axis.

The line $y = P$ is tangential to the curved part of the graph.

Find the values of a, b, c, d and e .

[5 marks]

$a = \underline{\hspace{2cm}}$ $b = \underline{\hspace{2cm}}$ $c = \underline{\hspace{2cm}}$ $d = \underline{\hspace{2cm}}$ $e = \underline{\hspace{2cm}}$

8

Turn over ►

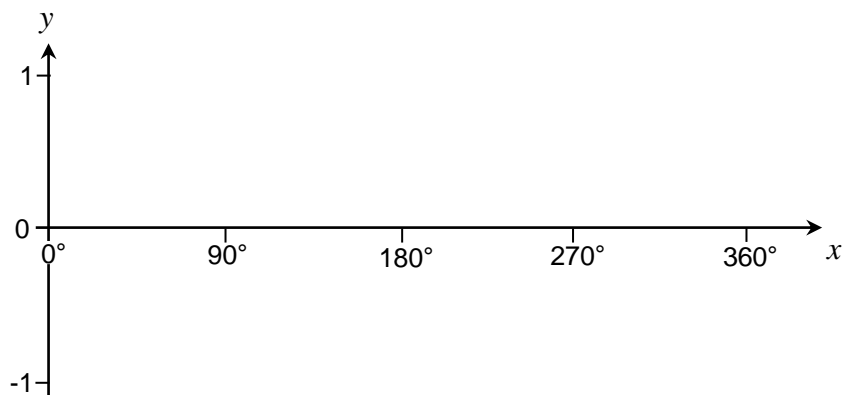




9 A function f is given by

$$\begin{aligned} f(x) &= \sin(x^\circ) & 0^\circ \leq x < 180^\circ \\ &= 0 & 180^\circ \leq x < 270^\circ \\ &= \cos(x^\circ) & 270^\circ \leq x \leq 360^\circ \end{aligned}$$

9 (a) Draw a sketch of $y = f(x)$ for values of x from 0° to 360° [3 marks]



9 (b) $0 < k < 1$

How many solutions are there to the equation $f(x) = k$ [1 mark]

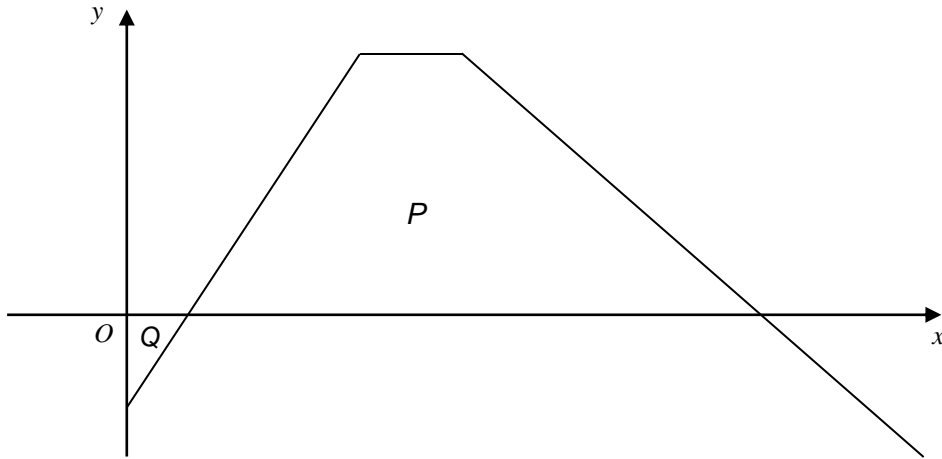
Answer _____





10 $f(x) = 2x - 5$ $0 \leq x < 10$
 $= a$ $10 \leq x < 15$
 $= 30 - x$ $x \geq 15$

A sketch of $y = f(x)$ is shown.



10 (a) Work out the value of a [2 marks]

$a =$ _____

10 (b) How many times bigger is the area of trapezium P than triangle Q ? [4 marks]

Answer _____