Name:

Level 2 Further Maths

Domains and Ranges
Sketching Functions

Corbettmaths

Ensure you have: Pencil or pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Revision for this topic

www.corbettmaths.com/more/further-maths/

1. A function f(x) is defined as

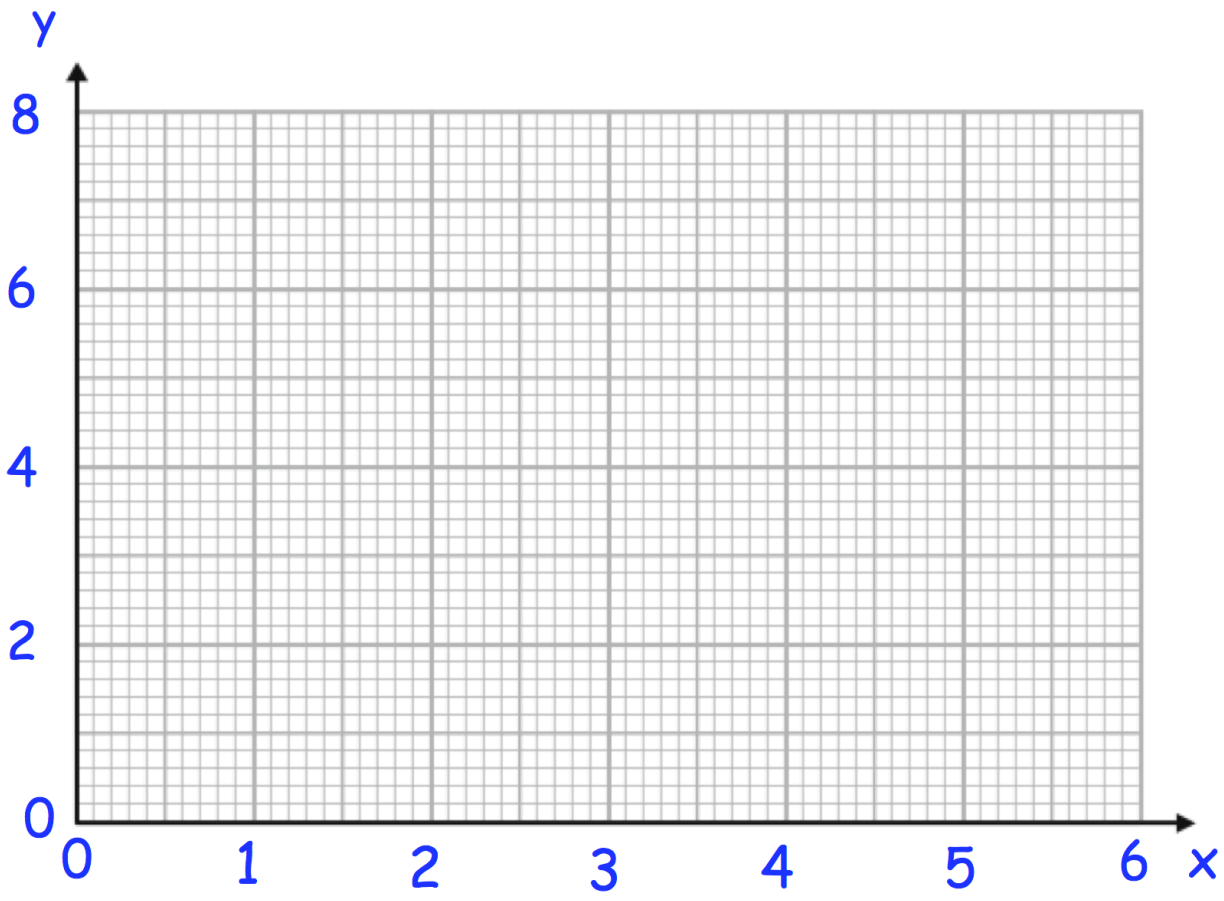
$$f(x) = 5 \qquad 0 \le x < 2$$

$$= 6 - \frac{1}{2}x \qquad 2 \le x < 4$$

$$= x \qquad 4 \le x \le 6$$

(a) Draw the graph of $y = f(x)$ on the axes below.

(3)



(b) State the range of $f(x)$

.....

(2)

2. A function f(x) is defined as

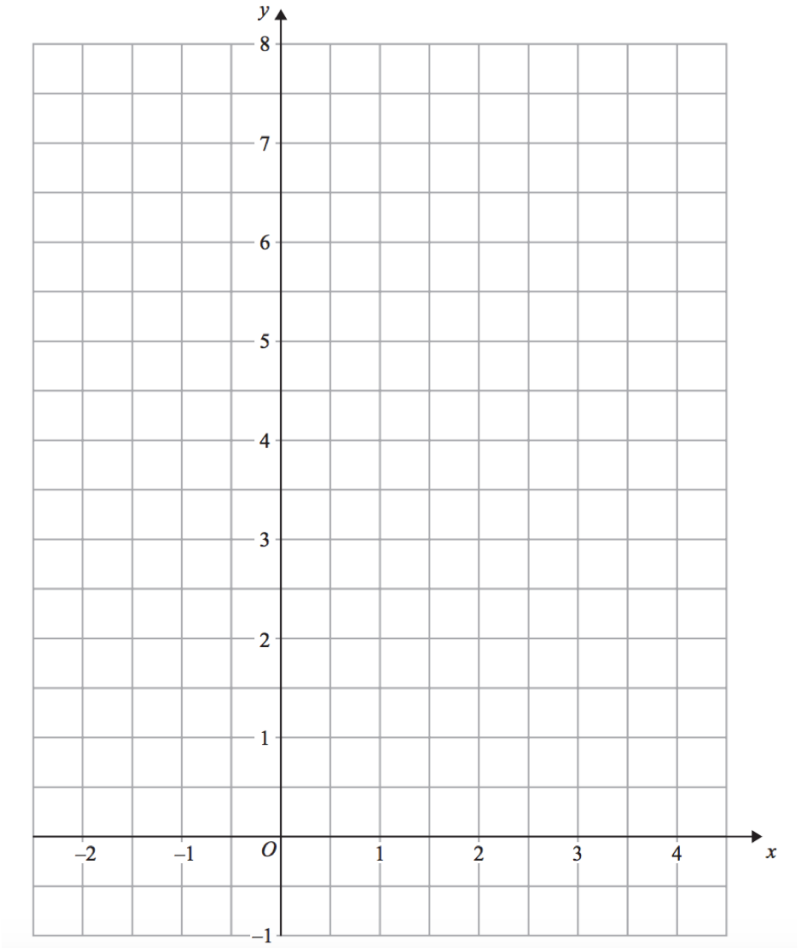
$$f(x) = x + 3 \qquad -2 \le x < -1$$

$$= 2 \qquad -1 \le x < 1$$

$$= 2x \qquad 1 \le x \le 4$$

(a) Draw the graph of $y = f(x)$ on the axes below.

(3)



(b) State the range of $f(x)$

……..

(2)

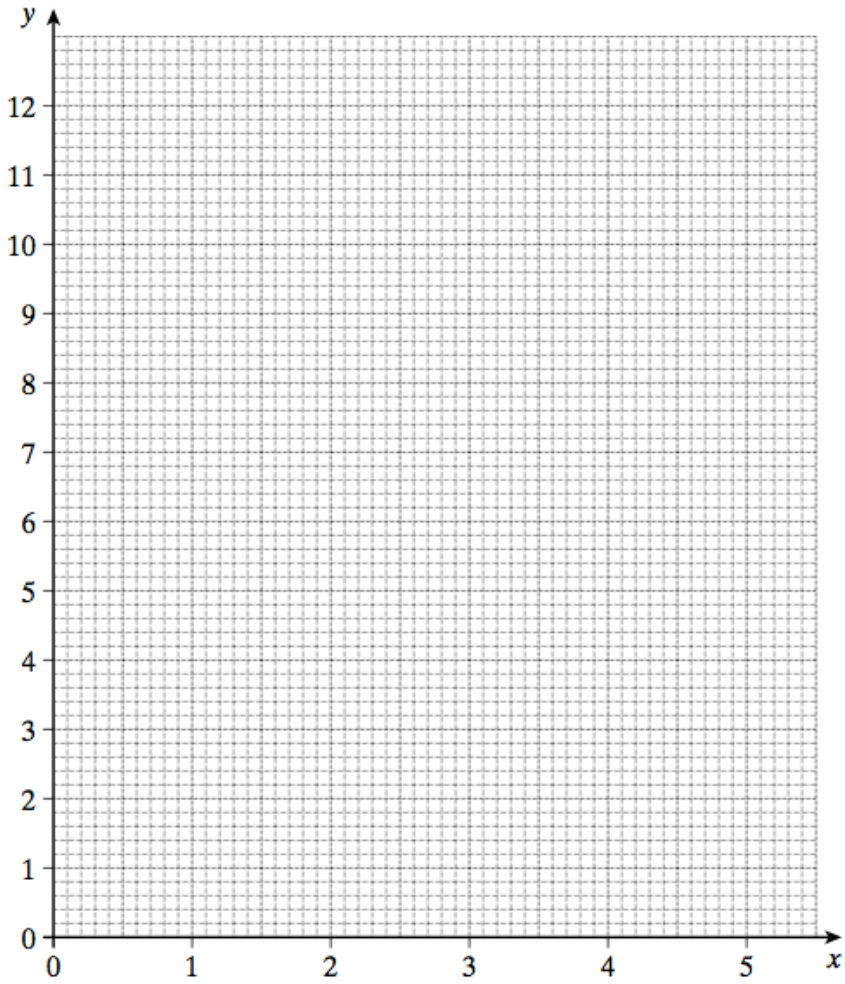
3. A function f(x) is defined as

$$f(x) = 9 - 3x \qquad 0 \le x < 2$$

$$= (5 - x)(x - 1) \qquad 2 \le x \le 5$$

(a) Draw the graph of $y = f(x)$ on the axes below.

(3)



(b) State the range of $f(x)$

……..

(2)

4. A function f(x) is defined as

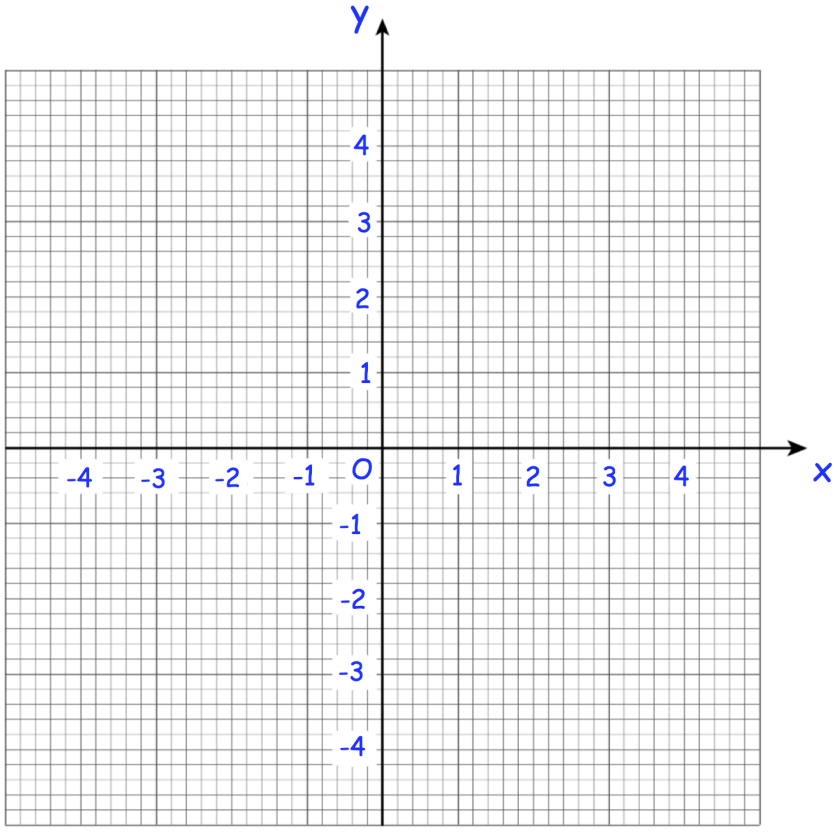
$$f(x) = -x \qquad -4 \le x < 0$$

$$= x^2 \qquad 0 \le x < 2$$

$$= 10 - 3x \qquad 2 \le x \le 4$$

(a) Draw the graph of $y = f(x)$ on the axes below.

(3)



(b) How many solutions are there to $f(x) = 0$

.....

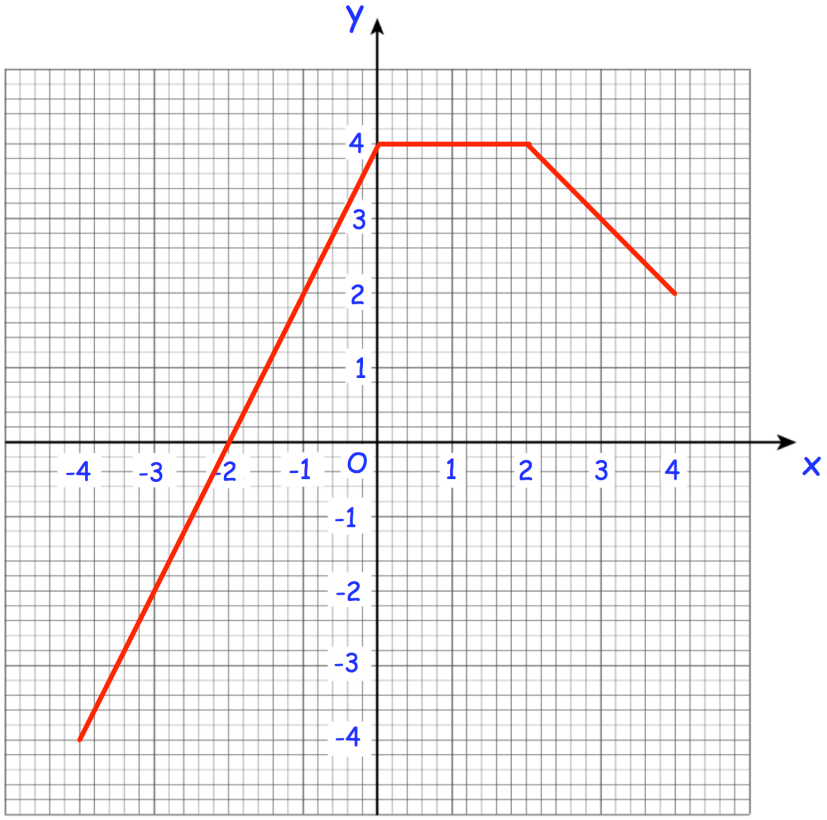
(2)

(c) State the range of $f(x)$

.....

(2)

5. Here is a graph of $y = f(x)$
It consists of three straight lines.



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

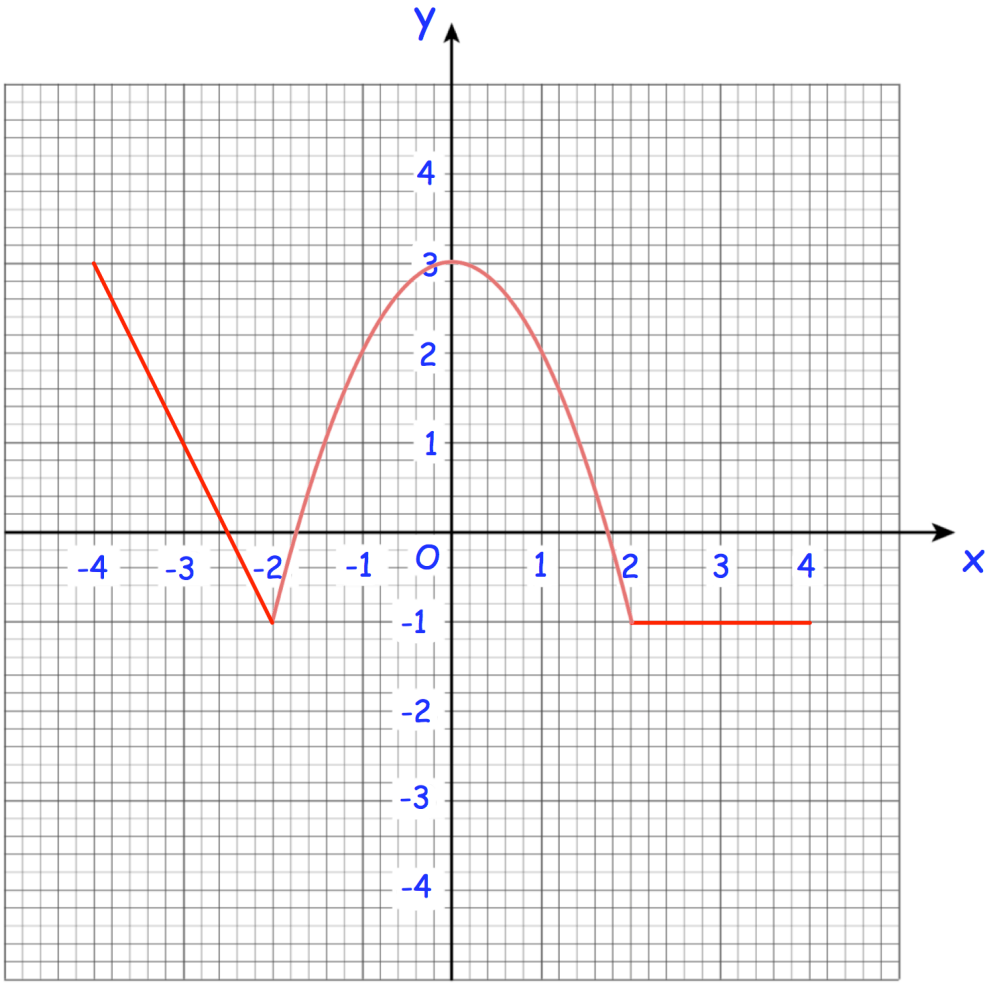
$f(x) =$ .....

.....

.....

(4)

6. Here is a graph of $y = f(x)$
It consists of a quadratic curve and two straight lines.



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

$f(x) =$ .....

.....

.....

(4)

7. A function f(x) is defined as

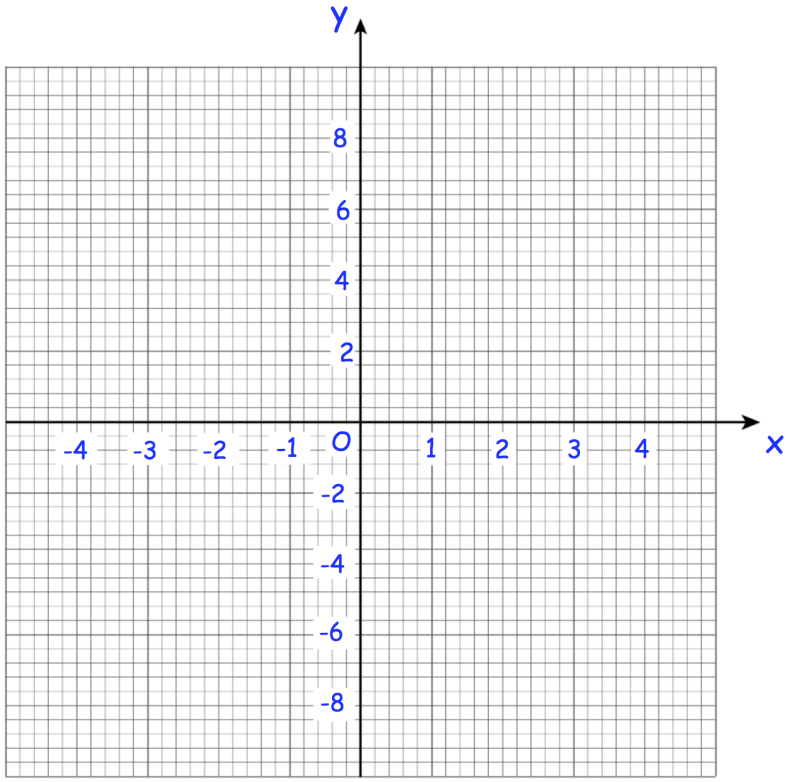
$$f(x) = 10 + x - x^2 \qquad -3 \le x < -1$$

$$= x^2 + 7 \qquad -1 \le x < 1$$

$$= \frac{8}{x} \qquad 1 \le x \le 4$$

(a) Draw the graph of $y = f(x)$ on the axes below.

(3)



(b) State the range of $f(x)$

.....

(2)

8. $f(x) = x^2 - 2$ for all values of x

(a) Find the value of $f(-4)$

.....
(1)

(b) What is the range of $f(x)$?

.....
(1)

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9. $f(x) = 8 - 2x^2$ for all values of x

Write down the range of $f(x)$

.....
(1)

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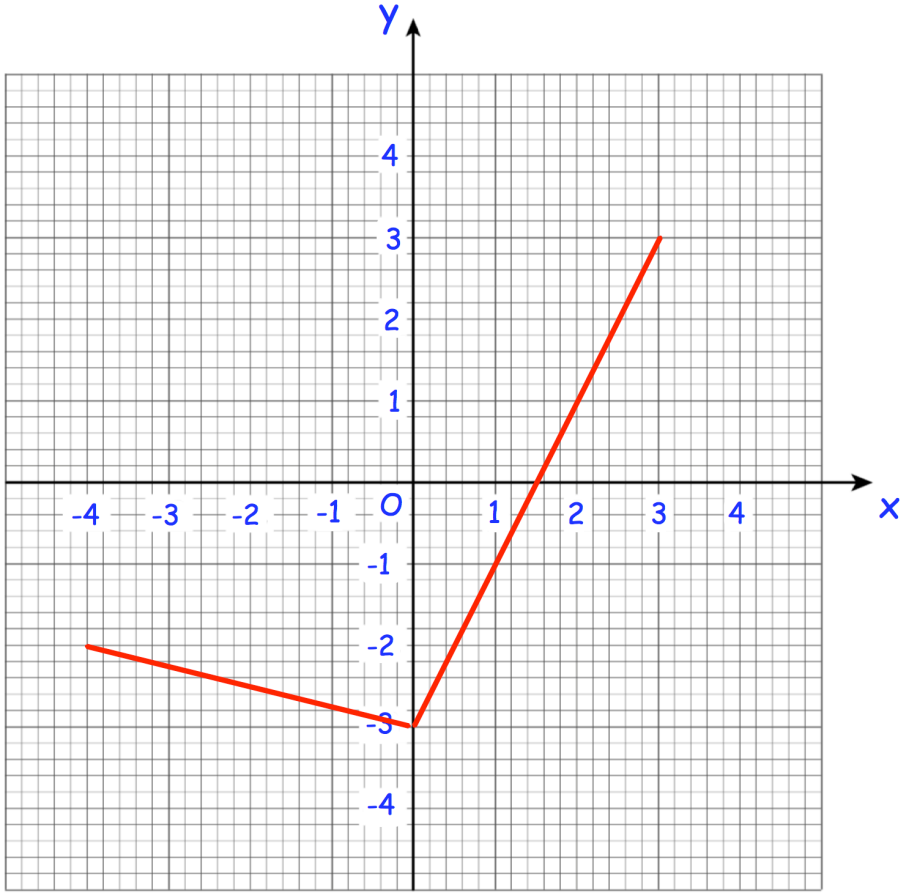
10. $f(x) = (x + 1)(x + 3)$ for all values of x

Write down the range of $f(x)$

.....
(2)

11. The graph of $y = f(x)$ is shown below.



(a) Write down the domain of $f(x)$

.....

(1)

(b) Write down the range of $f(x)$

.....

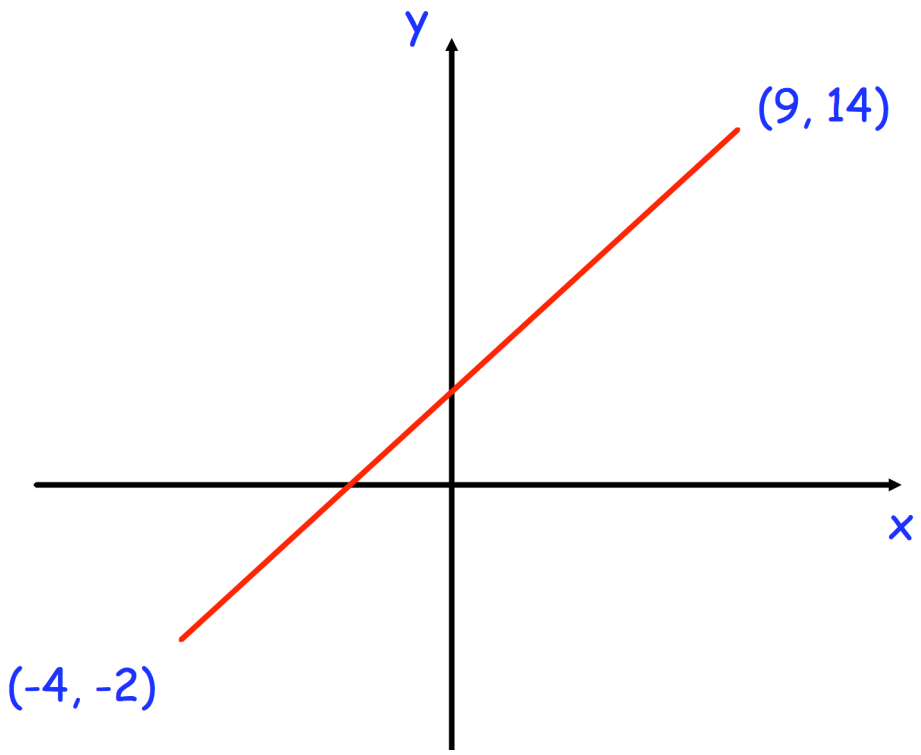
(1)

(c) Solve $f(x) = 1$

.....

(1)

12. Shown below is the graph of $y = f(x)$



(a) Write down the domain of $f(x)$

.....

(1)

(b) Write down the range of $f(x)$

.....

(1)

13. $f(x) = 5 - 2x$ for $-4 \leq x \leq 3$

Work out the range of $f(x)$

……..

(2)

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14. $g(x) = x^3 - 5$ for $-2 \leq x \leq 3$

Work out the range of $g(x)$

……..

(2)

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15. $f(x) = 9x - 2$

The range of $f(x)$ is $-38 \leq f(x) \leq 61$

Work out the domain of $f(x)$

……..

(2)

16. $g(x) = 3 - 2x$

The range of $g(x)$ is $-7 \leq g(x) \leq 6$

Work out the domain of $g(x)$

……..

(2)

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17. The function $f(x)$ is defined as

$$f(x) = 14 - 3x \qquad\qquad p \leq x < 8$$

The range of $f(x)$ is $-10 \leq f(x) \leq 30.5$

Work out the value of p

……..

(2)

18. $f(x) = cosx$ for $90^\circ \leq x \leq 120^\circ$

Work out the range of $f(x)$

……..

(2)