

Name:

Exam Style Questions

Functions



Equipment needed: Ruler, Pencil, Calculator and Pen

Guidance

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

Video Tutorial

www.corbettmaths.com/contents

Videos 369, 370



Answers and Video Solutions



1. $f(x) = 3x - 7$

(a) Work out the value of $f(5)$

.....
(1)

(b) Work out the value of $f(-2)$

.....
(1)

2. $f(x) = x^3 - 6x + 2$

Work out the value of $f(5)$

.....
(1)

3. $f(x) = 4x - 10$

$g(x) = x + 9$

Work out the value of $fg(12)$

.....
(2)

4. $f(x) = 5x$

Write down the expression for $f^{-1}(x)$

$$f^{-1}(x) = \dots\dots\dots$$

(1)

5. Given $f(x) = \frac{2x + 1}{3}$

(a) Calculate the value of $f(7)$

.....
(1)

(b) Find $f^{-1}(x)$

$$f^{-1}(x) = \dots\dots\dots$$

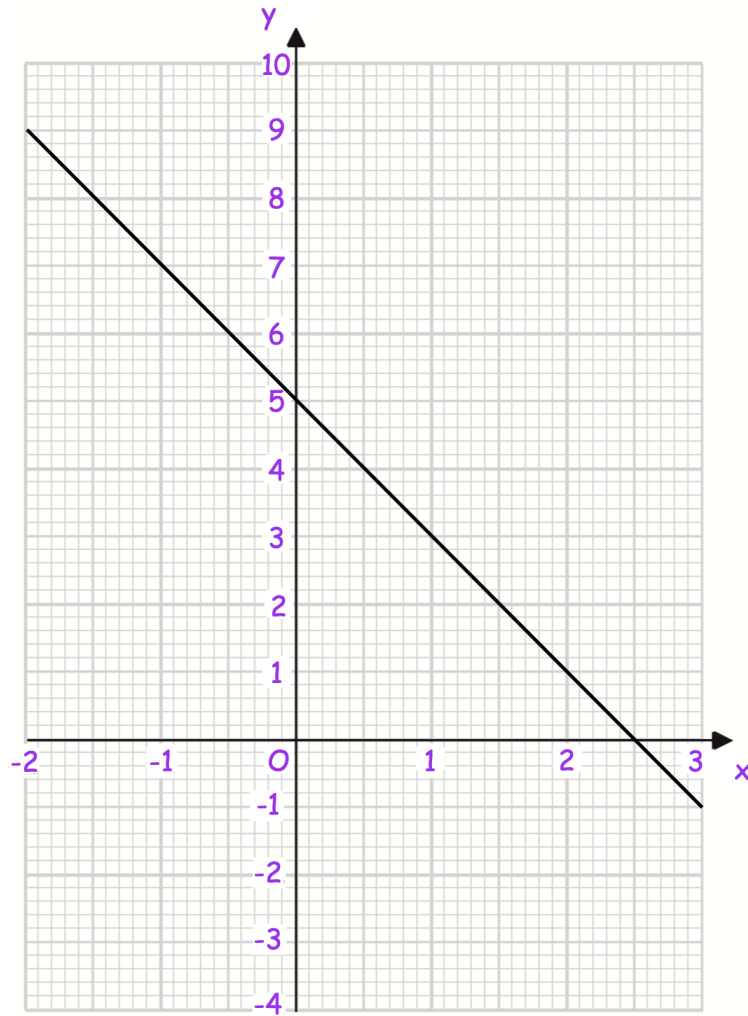
(2)

6. For $x > 0$, $f(x) = \frac{48}{\sqrt{x}}$

Find $f(9)$

.....
(1)

7. The graph of $y = f(x)$ is drawn on the grid.



(a) Write down the value of $f(-1)$

.....
(1)

$$f(a) = 2$$

(b) Write down the value of a

.....
(1)

(c) Write down the value of $ff(1)$

.....
(1)

8. $f(x) = 3x - 5$

$$g(x) = x^3$$

(a) Work out the value of $gf(1)$

.....
(2)

(c) Find $g^{-1}(x)$

$$g^{-1}(x) = \text{.....}$$

(1)

(c) Find $f^{-1}(55)$

.....
(2)

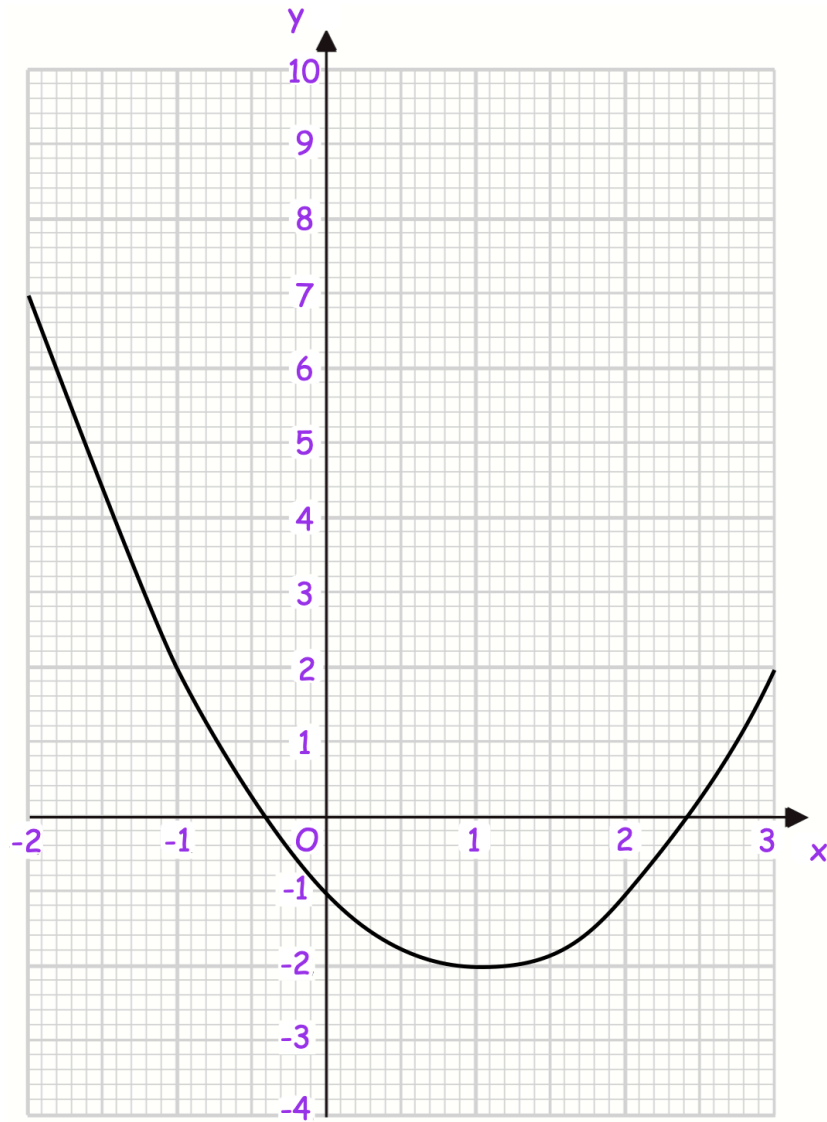
9. $f(x) = x^2$ and $g(x) = x - 3$

Find $fg(x)$

$$fg(x) = \text{.....}$$

(2)

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



(a) Write down the value of $f(1)$

.....
(1)

(b) Write down the estimates for the roots of $f(x) = 0$

.....
(1)

10. The functions $f(x)$ and $g(x)$ are given by the following:

$$f(x) = 3x - 1$$

$$g(x) = 2x + 4$$

(a) Calculate the value of $fg(2)$

.....
(2)

(b) Calculate the value of $ff(3)$

.....
(2)

(c) Find $gf(x)$

$gf(x) = \dots\dots\dots$
(2)

11. The functions $f(x)$, $g(x)$ and $h(x)$ are given by the following:

$$f(x) = x^2 - 3$$

$$g(x) = 2x + 1$$

$$h(x) = \frac{x}{2}$$

(a) Find $fg(x)$

$$fg(x) = \dots\dots\dots$$

(2)

(b) Find $gh(x)$

$$gh(x) = \dots\dots\dots$$

(2)

(c) Find $g^{-1}(x)$

$$g^{-1}(x) = \dots\dots\dots$$

(1)

12. The function f is such that $f(x) = 4x - 7$

(a) Solve $f(x) = 17$

$$x = \dots\dots\dots$$

(2)

(b) Find $f^{-1}(x)$

$$f^{-1}(x) = \dots\dots\dots$$

(2)

13. Given $f(x) = x^2 + 2$ and $g(x) = x + 14$

Find the values of a such that $f(a) = g(a)$

$$\dots\dots\dots$$

(3)

14. The functions $f(x)$ and $g(x)$ are given by the following:

$$f(x) = 8 - 3x$$

$$g(x) = 4x$$

(a) Calculate the value of $gf(3)$

.....
(2)

(b) Solve the equation $gf(x) = 80$

.....
(4)

15. $f(x) = \frac{ax + 9}{2}$

Given $f(3) = 54$, find the value of a

.....
(3)

16. $f(x) = 2x^3 - 1$

Find $f^{-1}(x)$

$$f^{-1}(x) = \dots\dots\dots$$

(3)

17. $g(x) = ax + 2b$

$$g(3) = 18$$

$$g(7) = 50$$

Work out the values of a and b

$$a = \dots\dots\dots$$

$$b = \dots\dots\dots$$

(3)

18. The function f is such that $f(x) = 2x - 1$

The function g is such that $g(x) = \frac{x}{8}$

(a) Find $fg^{-1}(x)$

$$fg^{-1}(x) = \dots\dots\dots \mathbf{(3)}$$

(b) Find $gf^{-1}(x)$

$$gf^{-1}(x) = \dots\dots\dots \mathbf{(3)}$$

19. $f(x) = 8 + 3x$

$$g(x) = \sqrt[3]{x + 4}$$

$h(x)$ is the composite function $gf(x)$

Find $h^{-1}(x)$

$$h^{-1}(x) = \dots\dots\dots$$

(4)

20. Given $f(x) = x^2 + 3x - 5$

Express $f(2x - 1)$ in the form $ax^2 + bx + c$

.....
(3)

21. $f(x) = x^2 + 4x - 1$

$g(x) = 3x - 1$

Solve $fg(x) = 5x^2 + 2x + 4$

.....
(5)

22. $f(x) = \frac{x - 9}{3x + 1}$

Find $f^{-1}(x)$

$f^{-1}(x) = \dots\dots\dots$
(4)

23. The function f is such that $f(x) = kx + 3$

The function g is such that $g(x) = 2x - 4$

Given that $gf(2) = 34$

work out the value of k

$k = \dots\dots\dots$
(3)

24. For all values of x ,

$$f(x) = x^2 + 4$$

$$g(x) = x - 9$$

Solve $fg(x) = gf(x)$

$\dots\dots\dots$
(4)

25. $f(x) = x^2 + 2x + 1$

Show that $f(x + 2) - f(x) = 4x + 8$

(4)