

GCSE Maths: Function notation (Higher): answers

GCSE Maths - Functions and Advanced Graphs - Higher - Lesson 25.1

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch25-functions-advanced-graphs/higher/function-notation/

Exercise 25A Function notation Non-calculator

1 $f(x) = 4x - 3$. Work out

(a) $f(2)$

Answer: 5

(b) $f(0)$

Answer: -3

(c) $f(-3)$

Answer: -15

(d) $f(10)$

Answer: 37

2 $g(x) = x^2 + 1$. Work out

(a) $g(3)$

Answer: 10

(b) $g(-4)$

Answer: 17

(c) $g(0)$

Answer: 1

(d) $g(0.5)$

Answer: 1.25

3 Here is a function machine for f . (a) Write $f(x)$ in the form $f(x) = \dots$ (b) Work out $f(5)$ and $f(-2)$.



Answer: $f(x) = 4x + 3$; $f(5) = 23$; $f(-2) = -5$

4 $h(x) = 20 \div x$. Work out

(a) $h(4)$

Answer: 5

(b) $h(-5)$

Answer: -4

(c) $h(0.5)$

Answer: 40

(d) $h(0.25)$

Answer: 80

5 $p(x) = 2x^2 - 5x + 3$. Work out

(a) $p(1)$

Answer: 0

(b) $p(-2)$

Answer: 21

(c) $p(3)$

Answer: 6

6 $f(x) = \frac{x+6}{2}$. Work out

(a) $f(8)$

Answer: 7

(b) $f(-4)$

Answer: 1

(c) $f(0)$

Answer: 3

7 $f(x) = \sqrt{x+9}$. Work out

(a) $f(16)$

Answer: 5

(b) $f(0)$

Answer: 3

(c) $f(-5)$

Answer: 2

8 $g(x) = x^3 - 2x$. Work out $g(-3)$.

Answer: -21

9 $f(x) = 2x + 5$. Solve

(a) $f(x) = 17$

Answer: $x = 6$

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

Answer: $x = -4$

(c) $f(x) = 0$

Answer: $x = -2.5$

(d) $f(x) = 4.5$

Answer: $x = -0.25$

10 $g(x) = x^2 - 7$. Solve

(a) $g(x) = 18$

Answer: $x = -5$ or $x = 5$

(b) $g(x) = 9$

Answer: $x = -4$ or $x = 4$

(c) $g(x) = -7$

Answer: $x = 0$

11 $f(x) = x^2 + 3x$. Solve $f(x) = 10$.

Answer: $x = -5$ or $x = 2$

12 $f(x) = 24 \div x$. Solve

(a) $f(x) = 6$

Answer: $x = 4$

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

Answer: $x = -8$

(c) $f(x) = 0.5$

Answer: $x = 48$

13 A taxi fare, in pounds, for a journey of d miles is $C(d) = 2.5 + 1.8d$. (a) Work out $C(7)$. (b) A fare is £24.10. How far was the journey? (In your working, write the function as $C(x) = 1.8x + 2.5$.)

(a) The cost of a 7-mile journey, in pounds

Answer: £15.10

(b) The distance for a fare of £24.10, in miles

Answer: 12 miles

14 The temperature in degrees Fahrenheit is given by $F(C) = 1.8C + 32$, where C is the temperature in degrees Celsius. (In your working use $F(x) = 1.8x + 32$.)

(a) Work out $F(100)$

Answer: 212

(b) Work out $F(-10)$

Answer: 14

- (c) Solve $F(x) = 50$. What does the answer mean?

Answer: $x = 10$ (50°F is 10°C)

- 15 $g(x) = 3x - 1$. Write each of these as simply as possible.

- (a) $g(a + 2)$

Answer: $3a + 5$

- (b) $g(2a)$

Answer: $6a - 1$

- (c) $g(a^2)$

Answer: $3a^2 - 1$

- 16 Dev says: "For $f(x) = x^2 + 2$ I find $f(-3) = f(3)$, but for $g(x) = x^3$ I find $g(-3) = -g(3)$." Show that Dev is correct.

Answer: Both statements are true ($11 = 11$ and $-27 = -27$)

- 17 $f(x) = 2x + 3$. Show that $f(a + 2) - f(a) = 4$ for every value of a .

Answer: $f(a + 2) - f(a) = 4$

- 18 $g(x) = x^2 + 1$. Explain why there is no value of x for which $g(x) = 0$.

Answer: $x^2 = -1$ has no real solution

- 19 $f(x) = ax + b$, where a and b are numbers. $f(2) = 7$ and $f(5) = 16$. Find the values of a and b .

Answer: $a = 3$, $b = 1$