



INTRODUCTION TO FUNCTIONS

Task 1 – Substitute the given values of x into the following functions.

1) $f(x) = x + 3$, find $f(2)$
 $f(2) = 2 + 3 = 5$

2) $f(x) = 2x$, find $f(5)$
 $f(5) = 2 \times 5 = 10$

3) $f(x) = x^2$, find $f(4)$
 $f(4) = 4^2 = 16$

4) $f(x) = x^2 + 1$, find $f(3)$
 $f(3) = 9 + 1 = 10$

5) $f(x) = 3x - 2$, find $f(6)$
 $f(6) = 18 - 2 = 16$

6) $f(x) = x^2 - x$, find $f(5)$
 $f(5) = 25 - 5 = 20$

7) $f(x) = 2x^2$, find $f(3)$
 $f(3) = 2 \times 9 = 18$

8) $f(x) = x^2 + 2x$, find $f(4)$
 $f(4) = 16 + 8 = 24$

9) $f(x) = 3x^2 - 1$, find $f(2)$
 $f(2) = 12 - 1 = 11$

10) $f(x) = x^2 + x - 2$, find $f(5)$
 $f(5) = 25 + 5 - 2 = 28$

11) $f(x) = \frac{2x^2+1}{4}$, find $f(3)$
 $f(3) = \frac{2(3)^2+1}{4} = 4.75$

12) $f(x) = \frac{1-x^3}{x}$, find $f(-1)$
 $f(-1) = \frac{1-(-1)^3}{-1} = -2$

Task 2

13) Given that $f(x) = x + 4$, solve $f(x) = 9$.
 $x + 4 = 9$
 $x = 5$

14) Given that $f(x) = 2x$, solve $f(x) = 14$.
 $2x = 14$
 $x = 7$

15) Given that $f(x) = x^2 + 1$, solve $f(x) = 10$.
 $x^2 + 1 = 10$
 $x^2 = 9$
 $x = 3$ or $x = -3$

16) Given that $f(x) = 3x - 1$, solve $f(x) = 11$.
 $3x - 1 = 11$
 $3x = 12$
 $x = 4$

17) Given that $f(x) = x^2 - 4$, solve $f(x) = 5$.
 $x^2 - 4 = 5$
 $x^2 = 9$
 $x = 3$ or $x = -3$

18) Given that $f(x) = 2x^2$, solve $f(x) = 32$.
 $2x^2 = 32$
 $x^2 = 16$
 $x = 4$ or $x = -4$

19) Given that $f(x) = x^2 + 2x$, solve $f(x) = 15$.
 $x^2 + 2x = 15$
 $x^2 + 2x - 15 = 0$
 $(x + 5)(x - 3) = 0$
 $x = -5$ or $x = 3$

20) Given that $f(x) = x^2 - x$, solve $f(x) = 6$.
 $x^2 - x = 6$
 $x^2 - x - 6 = 0$
 $(x + 2)(x - 3) = 0$
 $x = -2$ or $x = 3$

21) Given that $f(x) = x^2 + x - 2$, solve $f(x) = 10$.
 $x^2 + x - 2 = 10$
 $x^2 + x - 12 = 0$
 $(x + 4)(x - 3) = 0$
 $x = -4$ or $x = 3$

22) Given that

$$f(x) = 2x + 8 \quad \text{and} \quad g(x) = -x - 7$$

Solve $f(x) = g(x)$

$$2x + 8 = -x - 7$$

$$3x = -15$$

$$x = -5$$

23) Given that

$$f(x) = \frac{x}{5} + 3 \quad \text{and} \quad g(x) = 9 - x$$

Solve $f(x) = g(x)$

$$\frac{x}{5} + 3 = 9 - x$$

$$\frac{x}{5} + x = 6$$

$$x + 5x = 30$$

$$6x = 30$$

$$x = 5$$

24) Given that

$$f(x) = x^2 + 22 \quad \text{and} \quad g(x) = -7x$$

Solve $f(x) + g(x) = 12$

$$x^2 + 22 - 7x = 12$$

$$x^2 - 7x + 10 = 0$$

$$(x - 5)(x - 2) = 0$$

$$x = 5 \quad \text{or} \quad x = 2$$

Task 3 – For each of the following, state the type of function.

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

Linear

26) $f(x) = x^3 + 2x^2 - x + 1$

Cubic

27) $f(x) = x^2 + 4x + 5$

Quadratic

28) $f(x) = (x + 2)(x - 1)(x + 3)$

Cubic

29) $f(x) = \frac{4}{x}$

Reciprocal

30) $f(x) = 5 - 4x$

Linear

31) $f(x) = -x^2 + 3x - 9$

Quadratic

Task 4

32) What is the domain of a function?

The set of possible input values.

33) What is the range of a function?

The set of possible output values.

Task 5 – State a value of x (or range of values) that cannot be included in the domain of the following functions.

34) $f(x) = \frac{1}{x}$

$x \neq 0$

35) $f(x) = \frac{1}{x-3}$

$x \neq 3$

36) $f(x) = \frac{2}{x-1}$

$x \neq 1$

37) $f(x) = \frac{1}{x^2}$

$x \neq 0$

38) $f(x) = \frac{5}{x^2-9}$

$x \neq 3, -3$

39) $f(x) = \frac{1}{x(x-2)}$

$x \neq 0, 2$

40) $f(x) = \frac{1}{(x-1)(x+2)}$

$x \neq 1, -2$

41) $f(x) = \sqrt{x}$

$x < 0$

42) $f(x) = \sqrt{x+5}$

$x < -5$

43) $f(x) = 2 - \sqrt{4-x}$

$x > 4$