



## Twelfth Grade - Functions

1) Let  $A = \{-2, -1, 0, 1, 2\}$  and if  $f : A \rightarrow Z$  be given by  $f(x) = x^2 - 2x - 3$ . Find the range of  $f$ .

- $\{0, 5, 3, -4\}$
- $\{0, 5, -3, 4\}$
- $\{0, -5, -3, -4\}$
- $\{5, 0, -3, -4\}$

2) Consider the function  $f(x) = x^2$ . Let  $A = \{-2, -1, 0, 1, 2\}$  under this rule  $f(x) = x^2$  if we obtain  $f(-2) = 5$ ,  $f(-1) = 1$ ,  $f(0) = 0$ ,  $f(1) = 1$  then what could be the functions domain.

- $\{5, 1, 0, 1\}$
- None of these
- $\{3, 0, -2, 2\}$
- $\{-2, -1, 0, 1, 2\}$

3) Let  $A = \{-2, -1, 0, 1, 2\}$  and if  $f : A \rightarrow Z$  be given by  $f(x) = x^2 - 2x - 3$ . Find the pre image of 6

- -6
- No Pre image
- 7
- 3

4) Find the domain for which the function  $f(x) = 2x^2 - 1$  and  $g(x) = 1 - 3x$  are equal.

- $(2, 1/2)$
- $(-2, -1/2)$
- $(-2, -1)$
- $(-2, 1/2)$



5) Let  $f : \mathbb{R} \rightarrow \mathbb{R}$  be a function given by  $f(x) = x^2 + 1$ . Find  $f^{-1}(10)$

- $\pm 3$
- $\pm 5$
- $\pm 4$
- No Pre image

6) Let  $f = \{(1, 1), (2, 3), (0, -1), (-1, -3)\}$  be a function described by the formula  $f(x) = ax + b$ . Find  $a$  and  $b$ .

- $(2, -1)$
- $(2, 0)$
- $(-2, -1)$
- None of these

7) Find  $f(-1)$  if a function  $f : \mathbb{R} \rightarrow \mathbb{R}$  be defined by

$$f(x) = \begin{cases} 3x - 2, & x < 0 \\ 1, & x = 0 \\ 4x + 1, & x > 0 \end{cases}$$

- -5
- 9
- 8
- 7

8) If  $f(x) = x^2 - 3x + 4$ , then find the value of  $f(2x + 1)$

- $4x^2 - 2x + 2$
- $4x^2 - 2x - 2$
- $-4x^2 - 2x - 2$
- $4x$



9) If  $f(x) = (x - a)^2(x - b)^2$ , find  $f(a + b)$

- $ab$
- $xab$
- $a^2b^2$
- None of these

10) Find the domain for the function  $f(x) = \sqrt{x - 2}$

- $[2, \infty)$
- $[2, -5)$
- $(0, 0)$
- $(-2, \infty]$

11) Find the domain for the function  $f(x) = \sqrt{4 - x^2}$

- $[-2, 2]$
- $[2, \infty)$
- $[2, -2)$
- $(-2, \infty)$

12) Find the range of the function  $f(x) = \frac{4 - x}{x - 4}$

- $x$
- $-1$
- $2$
- $\emptyset$

13) Find the range of  $f(x) = \frac{x - 2}{3 - x}$

- $\mathbb{R} \setminus \{2\}$
- $\mathbb{R} \setminus \{0\}$
- $\mathbb{R} \setminus \{1\}$
- $\mathbb{R} \setminus \{-1\}$



14) How many terms are there in GP 3, 6, 12, ....., 384?

- 3
- 8
- 30
- 35

15) Find the 9th term of the GP 2, 4, 8, 16 .....

- 625
- 453
- 512
- 320

16) Mary buys a Chocolate box  $A(P) = 50P^2 - 15p + 30$ , each Chocolate in the Chocolate box worth  $p = \$3$ . Find the worth of the Chocolate box.

- 345
- 450
- 400
- 435

17) Kevin runs in a playground  $P(t) = 40t^2 - 30t + 3$  meters. The time taken by him,  $t = 2s$ . Then find the total distance covered by Kevin.

- 98
- 100
- 102
- 105



18) In Cadbury city average consumption of Chocolate by a child for respective years are given. Find the rate of change?

Year	1980	1990	2000	2010
Consumption	720	870	1020	1170

- 15
- 14
- 25
- -15

19) For the function  $f(x) = (x - 3)^2$ . Find the average rate of change between the points at  $x = 1$ ,  $x = 3$

- -2
- 4
- 6
- 3

20) Let  $f$  be in subset of  $Z \times Z$  defined by  $f = \{(ab, (a + b)) : a, b \in Z\}$ . Then  $f$  is a

- Complement Function
- Function
- Composite Function
- Not a Function

21) Find the range of  $f$ , if  $f : R \rightarrow R$  be defined as

$$f(x) = \begin{cases} 1, & \text{if } x \in Q \\ -1, & \text{if } x \notin Q \end{cases}$$

- $[0, 1]$
- $[0, -1]$
- $[1, 1]$
- $[1, -1]$



22) Determine  $\{x : f(x) = 1\}$ , if  $f : \mathbb{R} \rightarrow \mathbb{R}$  be such that  $f(x) = 2^x$ ?

- 0
- 4
- x
- 1

23) The function f and g is defined as

$$f(x) = \begin{cases} x^2, & 0 \leq x \leq 3 \\ 3x, & 3 \leq x \leq 10 \end{cases}$$

$$g(x) = \begin{cases} x^2, & 0 \leq x \leq 2 \\ 3x, & 2 \leq x \leq 10 \end{cases}$$

- g is a function
- f is a function but g is not a function is a function
- f is a function
- f and g is a function

24) If  $f(x) = x^2$ , find  $\frac{f(1.1) - f(1)}{(1.1) - 1}$

- 3.1
- 4.1
- 5.1
- 2.1

25) Find the domain of the function  $f(x) = \sqrt{4-x} + \frac{1}{\sqrt{x^2-1}}$

- $(-1, 1) \cup (1, 4]$
- $(-1, -1) \cup (1, 4]$



- $(?, -1) \cup (1, 4]$
- $(-?, -1) \cup (-1, -4]$

26) Find the domain of the function  $f(x) = (1/2 - \sin 3x)$

- N
- Odd numbers
- R
- Even numbers

27) Find  $f(-3)$

$$f(x) = \begin{cases} x^2, & x < 0 \\ x, & 0 \leq x < 1 \\ 1/x, & x \geq 1 \end{cases}$$

- 3
- -4
- 4
- -3

28) Find the range of the function  $f(x) = 3 / (2 - x^2)$

- $(-?, 0) \cup [-1, ?)$
- $(-?, 0) \cup [-1, -?)$
- $(-?, 0) \cup [1, ?)$
- $(?, 0) \cup [1, ?)$

29) Find the range of the function  $f(x) = 3 / (2 - x^2)$

- $(-?, 0) \cup [-3/2, -?)$



- $(?, 0) ? [-3/2, ?)$
- $(-?, 0) ? [3/2, ?)$
- $(?, 0) ? [3/2, ?)$

30) Find the general term of the progression  $1/4, -1/2, 1, -2$

- $(-1)^{n-1} (2)^{n-1}$
- $(-1)^n (2)^{n-1}$
- $(-1)^{n-1} (2)^{n-1}$
- $(-1)^{n-1} (2)^{n-1}$