In this worksheet you will learn how to use function notation to evaluate and interpret functions for various inputs. You are expected to substitute given inputs into the function notation and simplify.

Easy Questions

1. Given $f(x) = 2x + 3$, find $f(4)$.

2. Given $g(x) = -x + 7$, find $g(0)$.

3. Given $h(x) = 3x$, find $h(-3)$.

4. Given $p(x) = x + 5$, find $p(2)$.

5. Given $q(x) = 4$, find $q(10)$.

Intermediate Questions

6. Fill in the table for the function $f(x) = 2x + 1$ for the following values of x: -2, -1, 0, 1, 2.

7. Given $f(x) = 3x + 4$, find $f(-1)$.

8. Given $f(x) = \dfrac{1}{2}x + 3$, find $f(8)$.

9. Given $f(x) = 4x - 1$, find $f(2.5)$.

10. Given $f(x) = -2x + 5$, find $f(0)$.

11. Find the value of x such that $f(x) = 7$ if $f(x) = x + 2$.

12. Given $f(x) = 3x + 5$, find $f(2)$ and $f(4)$.

13. Given $f(x) = -x$, find $f(3 + 1)$.

14. Evaluate the expression: If $f(x) = 2x - 3$, compute $2\left[f(2)\right]$.

15. Given $f(x) = \dfrac{1}{x + 2}$, find $f(-1)$.

16. For $f(x) = 3 - x$, find $[f(0) - f(2)]$.

17. Write an expression for $f(a)$ if $f(x) = 2x + 3$, and then evaluate $f(a)$ when $a = 5$.

18. Given $f(x) = x + 4$, write an expression for $f(2x)$ and then evaluate it for $x = 3$.

19. Given $f(x) = 3x + 1$, find $f(5)$ and $f(-2)$.

20. For $f(x) = 2x - 7$, evaluate the expression $f(4) - f(-3)$.

Hard Questions

21. For the function $f(x) = x + 2$, find an expression for $f(x + 1) - f(x)$ and explain its significance.

22. Assume $f(x) = 3x - 4$. Show that if $f(a) = f(b)$ then $a = b$.

23. Given $f(x) = 2x + 5$, if $f(3x) = 17$, find the value of x.

24. For the function $f(x) = 5 - x$, find an expression for $f(2) - f(1)$.

25. Let $f(x) = \dfrac{x}{3} + 1$ and consider the input $2 + t$. Write and simplify the expression for $f(2 + t)$.

26. Given $f(x) = 4x - 2$, evaluate and simplify the expression $\dfrac{f(2) + f(3)}{f(1)}$.

27. If $f(x) = x + 7$, verify the equality $3\,[f(2)] = f(5)$.

28. For $f(x) = 2x + 1$, calculate $f(0) - f(-3)$.

29. Let $f(x) = 6 - x$. Write an expression for $f(x - 1)$ in terms of x and simplify.

30. For the function $f(x) = 2x + 3$, prove that $f(x + c) - f(x) = 2c$, where c is a constant. Explain your reasoning.