ILLAWARRA TUTORING

This worksheet focuses on function notation. You will learn how to evaluate functions given various inputs and interpret the outcomes using the notation $f(x)$. Read each question carefully and show your working.

Easy Questions

1. Given $f(x) = 2x + 1$, find $f(3)$.
2. If $g(x) = 3x - 5$, determine $g(-1)$.
3. Given $h(x) = x^2 + 2$, calculate $h(0)$.
4. For $f(x) = \dfrac{x+1}{2}$, compute $f(4)$.
5. If $p(x) = 5$ for all x, find $p(100)$.

Intermediate Questions

6. If $f(x) = 3x + 4$, express $f(a)$ in terms of a.
7. For $f(x) = x^2 - 2x + 1$, compute $f(2)$.
8. Given $f(x) = 2x^2 + 3x - 1$, evaluate $f(1)$.
9. For the function $f(x) = \dfrac{1}{x}$ (with $x \neq 0$), find $f(5)$.
10. If $f(x) = \sqrt{x+4}$, determine $f(5)$.
11. Given $f(x) = |x|$, find $f(-7)$.
12. For $f(x) = \dfrac{2x^2 - 1}{3}$, evaluate $f(2)$.
13. Given $f(x) = 5 - x$, compute $f(0)$ and $f(5)$.
14. If $f(x) = \dfrac{4x}{x+2}$, determine $f(2)$.
15. For $f(x) = 3 - \dfrac{1}{x+1}$, evaluate $f(1)$.
16. If $f(x) = x^2 - x$, express $f(t)$ and evaluate $f(3)$.

17. For the function $g(x) = 2x + 5$, determine $g(2a)$ in terms of a.

18. Determine the value of k such that $f(k) = 10$, given that $f(x) = 2x + 2$.

19. Replace x with $a + 1$ in the function $f(x) = 3(x - 2)$ and simplify the resulting expression.

20. Given $f(x) = \dfrac{x^2 - 1}{x - 1}$ (with $x \neq 1$), evaluate $f(2)$.

Hard Questions

21. Given $f(x) = 4x - 7$, determine and simplify the expression for $f(2x)$.

22. If $f(x) = x^3$, write an expression for $f(a + 2)$ and expand your answer.

23. Given $f(x) = 2x + 3$ and $g(x) = f(x) - 4$, evaluate $g(5)$.

24. For the function $f(x) = \dfrac{x + 2}{x - 1}$, express $f(3x)$ in terms of x.

25. Let $f(x) = x^2 + x$. Find an expression for $f(m + 1)$ in terms of m and simplify.

26. Given $f(x) = \dfrac{2x - 3}{x + 4}$, evaluate $f(-4)$ and explain any restriction on x.

27. If $f(x) = \dfrac{1}{x^2 + 1}$, express $f(2t)$ in terms of t.

28. For the function $f(x) = 3x + 1$, find all x such that $f(x) = f(-x)$.

29. Given $f(x) = \dfrac{x + 1}{x - 2}$, express $f(x + 3)$ in its simplest form.

30. The function f is defined by $f(x) = \dfrac{2x}{x + 3}$. Identify the restriction on the domain and then evaluate $f(3)$ and $f(0)$.