

HW002 (HW-CALCULUS)

Chapter 1 Review: Functions

Determine the domain of each function.

1. $f(x) = \sqrt{2x+12}$
 $\sqrt{2x+12} \geq 0$
 $2x+12 \geq 0$ $x \geq -6$

2. $f(x) = \frac{1}{x^2-4}$
 $\frac{1}{x^2-4} \neq 0$
 $x^2-4 \neq 0$ $x \neq \pm 2$

Evaluate each function for the given values.

3. $f(x) = 3x^2 - 4$
 a. $f(-4) = 3(-4)^2 - 4 = 44$
 b. $f(0) = 3(0)^2 - 4 = -4$
 c. $f(4) = 3(4)^2 - 4 = 44$

4. $g(x) = 5x + 3$
 a. $g(-4) = 5(-4) + 3 = -17$
 b. $g(0) = 5(0) + 3 = 3$
 c. $g(4) = 5(4) + 3 = 23$

5. $h(x) = \begin{cases} 2x-5, & x \leq -4 \\ 3x^2-2x, & -4 < x \leq 4 \\ x^2+2, & x > 4 \end{cases}$
 a. $h(-4) = 2(-4) - 5 = -13$
 b. $h(0) = 3(0)^2 - 2(0) = 0$
 c. $h(4) = 3(4)^2 - 2(4) = 44$
 d. $h(5) = 5^2 + 2 = 27$

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6. $f(x) = 3x^2 - 2x + 4$
 $x \in \mathbb{R}$

7. $f(x) = \frac{1}{x^2-4}$
 $\frac{1}{x^2-4} \neq 0$
 $x^2-4 \neq 0$ $x \neq \pm 2$

8. $g(x) = 5x + 3$
 a. $g(-4) = 5(-4) + 3 = -17$
 b. $g(0) = 5(0) + 3 = 3$

9. $h(x) = 2x^2 + 3x - 4$
 a. $h(-4) = 2(-4)^2 + 3(-4) - 4 = 11$
 b. $h(0) = 2(0)^2 + 3(0) - 4 = -4$
 c. $h(4) = 2(4)^2 + 3(4) - 4 = 44$

10. $h(x) = \begin{cases} 2x-5, & x \leq -4 \\ 3x^2-2x, & -4 < x \leq 4 \\ x^2+2, & x > 4 \end{cases}$
 a. $h(-4) = 2(-4) - 5 = -13$
 b. $h(0) = 3(0)^2 - 2(0) = 0$
 c. $h(4) = 3(4)^2 - 2(4) = 44$
 d. $h(5) = 5^2 + 2 = 27$