

AP Calculus AB

Name _____

Worksheet: Limits

Date _____

Evaluate the following limits. You may NOT use a calculator on this assignment.

1. $\lim_{x \rightarrow 8} 7 =$

2. $\lim_{x \rightarrow 0} x =$

3. $\lim_{x \rightarrow 3} (7x - 4) =$

4. $\lim_{x \rightarrow -1} (2x^3 - 5x) =$

5. $\lim_{x \rightarrow 3} \sqrt{x^3 - 3x - 1} =$

6. $\lim_{x \rightarrow 3} \sqrt{5x^2 + 2x} =$

7. $\lim_{x \rightarrow 3} \frac{x^2 - 2x}{x + 1} =$

8. $\lim_{x \rightarrow 0} \frac{6x - 9}{x^3 - 12x + 3} =$

9. $\lim_{x \rightarrow 4} \frac{x^2 + 2x - 24}{x - 4} =$

10. $\lim_{x \rightarrow -2} \frac{x^2 + 7x + 10}{x + 2} =$

11. $\lim_{x \rightarrow 4} \frac{x^2 - 16}{x - 4} =$

12. $\lim_{x \rightarrow -1} \frac{x^2 + 7x + 6}{x^2 - 4x - 5} =$

13. $\lim_{x \rightarrow 2} \frac{x^2 - 2x}{x^2 - 4} =$

15. $\lim_{y \rightarrow 4} \frac{4 - y}{2 - \sqrt{y}} =$

17. $\lim_{x \rightarrow \pi} \cos(x) =$

19. $\lim_{x \rightarrow 2\pi} \cos(x) =$

21. $\lim_{x \rightarrow 3} \frac{1 - x}{x^2 - 1} =$

23. $\lim_{x \rightarrow 0} \frac{x}{x} =$

14. $\lim_{t \rightarrow 3} \frac{9 - t}{3 - \sqrt{t}} =$

16. $\lim_{x \rightarrow \frac{\pi}{2}} \sin(x) =$

18. $\lim_{x \rightarrow \frac{3\pi}{2}} \sin(x) =$

20. $\lim_{x \rightarrow 2} \frac{x^2 - 4x + 4}{x^2 + x - 6} =$

22. $\lim_{x \rightarrow 5} \frac{5 - x}{x^2 - 25} =$

24. $\lim_{x \rightarrow 3} \frac{x - 3}{6 - 2x} =$

Piecewise Functions and Limits

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

$$f\left(\frac{3}{4}\right) =$$

$$f(4) =$$

$$f(0) =$$

$$\lim_{x \rightarrow 0} f(x) =$$

$$\lim_{x \rightarrow -3} f(x) =$$

$$\lim_{x \rightarrow 4} f(x) =$$

$$\lim_{x \rightarrow 1^-} f(x) =$$

$$\lim_{x \rightarrow 1^-} f(x) =$$

$$\lim_{x \rightarrow 1} f(x) =$$

$$\lim_{x \rightarrow 2} f(x) =$$

$$\lim_{x \rightarrow -4} f(x) =$$

$$\lim_{x \rightarrow 0} f(x) =$$

$$2) f(x) = \begin{cases} -x^2 + 3 & \text{if } x \leq -2 \\ -2x + 2 & \text{if } -2 < x < 5 \\ (x-4)^2 + 4 & \text{if } x \geq 5 \end{cases}$$

$$f(2) =$$

$$f(0) =$$

$$f(5) =$$

$$\lim_{x \rightarrow -2} f(x) =$$

$$\lim_{x \rightarrow -2} f(x) =$$

$$\lim_{x \rightarrow -2} f(x) =$$

$$\lim_{x \rightarrow 0^-} f(x) =$$

$$\lim_{x \rightarrow 0^-} f(x) =$$

$$\lim_{x \rightarrow 0} f(x) =$$

$$\lim_{x \rightarrow 5^-} f(x) =$$

$$\lim_{x \rightarrow 5^-} f(x) =$$

$$\lim_{x \rightarrow 5} f(x) =$$