CALCULUS   **Name** _____

Limits Worksheet

1. $\lim\limits_{x \to 2} \; x^2 - 3x + 5$

2. $\lim\limits_{x \to -1} \dfrac{2x + 4}{5}$

3. $\lim\limits_{x \to 3} \dfrac{x - 3}{x^2 - 9}$

4. $\lim\limits_{x \to 25} \dfrac{x - 25}{\sqrt{x} - 5}$

5. $\lim\limits_{x \to 6} \dfrac{x^2 - 4x - 12}{x - 6}$

6. $\lim\limits_{x \to 2} \dfrac{x^3 - 8}{x - 2}$

7. $\lim\limits_{x \to 3} \dfrac{x - 3}{x^3 - 3x^2 + 5x - 15}$

8. $\lim\limits_{x \to 0} \dfrac{\sqrt{x + 4} - 2}{x}$

9. $\lim\limits_{x \to 0} \dfrac{\frac{1}{4 - x} - \frac{1}{4}}{\frac{x}{2}}$

10. $\lim\limits_{x \to 0} \dfrac{x^2 - 3x}{x}$

11. Use the table feature on your calculator to find the limit.

$\lim\limits_{x \to 0} \dfrac{1 - \cos x}{x}$

12. $\displaystyle\lim_{x \to 0^-} \frac{|3x|}{2x}$

13. $\displaystyle\lim_{x \to 9^-} \left[\frac{x}{9} \right]$

14. Determine if the limit exists by evaluating each of the one-sided limits and checking if they are equal.

$$\lim_{x \to 1} \quad \text{where} \quad f(x) = \begin{cases} 2x + 1, & x \leq 1 \\ 4 - x^2, & x > 1 \end{cases}$$

15. $\displaystyle\lim_{x \to \infty} \frac{2x^2 - 4x + 9}{4x^2 - 8}$

16. $\displaystyle\lim_{x \to \infty} \frac{3x^2 - 12x + 1}{3x - 6}$

17. $\displaystyle\lim_{x \to \infty} \frac{8 + 2x - 4x^3}{x^2 + 2x - 8}$

18. $\displaystyle\lim_{x \to -\infty} \frac{3x^5 + 5x}{x^5 + 2x^3 - 8}$

19. $\displaystyle\lim_{x \to -\infty} \frac{7x^2 - 5x + 1}{100x + 250}$

20. $\displaystyle\lim_{x \to -\infty} \frac{18 + x - x^4}{6x^4 + 3x^3}$

21. Find the slant asymptote of $f(x) = \dfrac{4x^2 - 3x + 7}{x - 5}$