PreCalc BC Limits Name:

Evaluate the limits below. State what the limit tells you about continuity or end behavior (ie. hole – give coordinates, jump, vertical asymptote, horizontal asymptote, etc.) After you have done the algebra, check with your calculator and make a sketch.

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

2. $\lim_{x \to 3} \frac{x^2 - 2x}{x + 1}$

3. $\lim_{x \to 0} \frac{6x - 9}{x^3 - 12x - 3}$

4. $\lim_{x \to 4} \frac{x^2 - 16}{x - 4}$

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

6. $\lim_{x \to \infty} \frac{3x + 1}{2x - 5}$

7. $\lim_{x \to -\infty} \frac{1}{x - 12}$

8. $\lim_{x \to \infty} \frac{x^3 - 2x}{97x^2 - 5}$

9. $\lim_{x \to -\infty} \sqrt{5 - x}$

10. $\lim_{x \to \infty} \frac{1000}{x}$

11. $\lim_{x \to 0} \frac{1000}{x}$

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

13. $\lim_{x \to 2} \frac{x^2 - 2}{x - 2}$

14. $\lim_{x \to \infty} \frac{x^2 - 2}{x - 2}$

15. $\lim_{x \to -\infty} \frac{x^2 - 2}{x - 2}$

16. $\lim_{x \to \infty} \frac{\sqrt{x^3 - 1}}{2x}$

17. $\lim_{x \to 0} \begin{cases} 2x - 4, & x \geq 2 \\ x^2 + 1, & x < 2 \end{cases}$

18. $\lim_{x \to 2} \begin{cases} 2x - 4, & x \geq 2 \\ x^2 + 1, & x < 2 \end{cases}$

19. $\lim_{x \to \infty} \frac{2x^2 - 6}{(x - 2)^2}$

20. $\lim_{x \to 0} p$

21. $\lim_{x \to -1} \frac{x+1}{x^3+1}$

22. $\lim_{x \to 1} \frac{x^3-1}{x^2-1}$

23. $\lim_{x \to 0} \frac{\sin x}{x}$ (Use calculator/ radians)

24. $\lim_{x \to \infty} \left(1 + \frac{1}{x}\right)^x$ (Use calculator)