

**Pre-Calculus
Limits Review**

Name:

Date:

Period:

Learning Target: I can find limits using purely algebraically methods.

1) $\lim_{x \rightarrow 2} \frac{x^2 - 1}{x^3 + 2}$

2) $\lim_{x \rightarrow -2} \frac{x + 2}{x^2 - 4}$

3) $\lim_{x \rightarrow -2} \frac{x^2 - 4}{x^3 + 8}$

4) $\lim_{x \rightarrow -1} \frac{\frac{1}{x+2} - 1}{x+1} - 1$

5) $\lim_{x \rightarrow 0} \frac{\sqrt{x+9} - 3}{x}$

6) $\lim_{x \rightarrow 0} \frac{\frac{1}{x+1} - 1}{x} - 1$

7) $\lim_{x \rightarrow 1} \frac{\sqrt{3} - \sqrt{x+2}}{1-x}$

8) $\lim_{x \rightarrow -2} \frac{x^2 - 1}{2x}$

Learning Target: I can use the properties of limits to evaluate limits.

For 9-12, use $\lim_{x \rightarrow c} f(x) = 4$ and $\lim_{x \rightarrow c} g(x) = 5$ to evaluate the limits.

9) $\lim_{x \rightarrow c} [f(x)]^3$

10) $\lim_{x \rightarrow c} [3f(x) - g(x)]$

11) $\lim_{x \rightarrow c} [f(x)g(x)]$

12) $\lim_{x \rightarrow c} \frac{f(x)}{g(x)}$

For 13-16, use $\lim_{x \rightarrow c} f(x) = 27$ and $\lim_{x \rightarrow c} g(x) = 12$ to evaluate the limits.

13) $\lim_{x \rightarrow c} \sqrt[3]{f(x)}$

14) $\lim_{x \rightarrow c} \frac{f(x)}{18}$

15) $\lim_{x \rightarrow c} [f(x)g(x)]$

16) $\lim_{x \rightarrow c} [f(x) - 2g(x)]$

Learning Target: I can find one-sided and two-sided limits.

17) $\lim_{x \rightarrow -1^+} (-|x+1| - 1)$ 18) $\lim_{x \rightarrow -2^-} (x + |2x+4|)$ 19) $\lim_{x \rightarrow 2^+} f(x), f(x) = \begin{cases} x^2 + 6x + 8, & x \leq -1 \\ -2x + 1, & x > -1 \end{cases}$ 20) $\lim_{x \rightarrow \frac{\pi}{2}^-} 2 \sec x$

21) $\lim_{x \rightarrow 2^+} \frac{x-2}{x^2 - 3x + 2}$ 22) $\lim_{x \rightarrow 1^+} \frac{x-1}{x^2 - 4x + 3}$ 23) $\lim_{x \rightarrow 2^+} f(x), f(x) = \begin{cases} x+1, & x \leq 2 \\ \frac{x}{2} + 2, & x > 2 \end{cases}$ 24) $\lim_{x \rightarrow \frac{\pi}{3}^+} -\cot(2x)$

Learning Target: I can calculate limits at infinity.

25) $\lim_{x \rightarrow \infty} \frac{x}{\sqrt{x^2 + 4}}$

26) $\lim_{x \rightarrow -\infty} \frac{2x^2}{4x+1}$

27) $\lim_{x \rightarrow \infty} \left(\frac{e^x}{x^4} + 4 \right)$

28) $\lim_{x \rightarrow -\infty} 3x \sin\left(\frac{1}{x}\right)$

29) $\lim_{x \rightarrow -\infty} \frac{-x+2}{x^2 + 2x + 2}$

30) $\lim_{x \rightarrow \infty} \frac{-2x^2 + 5}{3x^2 - 7x + 3}$

31) $\lim_{x \rightarrow \infty} \frac{12}{1-x^4}$

32) $\lim_{x \rightarrow \infty} \frac{5x^2 - x^6}{3x^2 + x^4}$