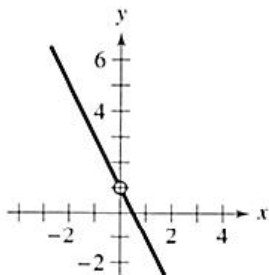


## Limits Algebraically AND Limits to Infinity Homework

Use the graph to determine each limit (if it exists)

1.  $g(x) = \frac{-2x^2 + x}{x}$

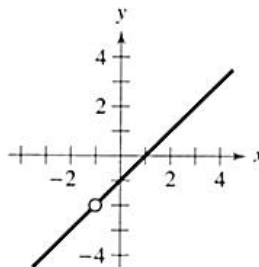


a)  $\lim_{x \rightarrow 0} g(x)$

b)  $\lim_{x \rightarrow -1} g(x)$

c)  $\lim_{x \rightarrow -2} g(x)$

2.  $f(x) = \frac{x^2 - 1}{x + 1}$



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

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

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

Find the limit (if it exists).

3.  $\lim_{x \rightarrow 6} \frac{x-6}{x^2-36}$

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

5.  $\lim_{x \rightarrow 1} \frac{x^4-1}{x-1}$

6.  $\lim_{y \rightarrow 0} \frac{\sqrt{5+y} - \sqrt{5}}{y}$

7.  $\lim_{x \rightarrow 2} \frac{4 - \sqrt{18-x}}{x-2}$

8.  $\lim_{x \rightarrow 0} \frac{\frac{1}{x+4} - \frac{1}{4}}{x}$

**Limits to Infinity:**

9.  $\lim_{x \rightarrow \infty} \frac{3}{x^2}$

10.  $\lim_{x \rightarrow \infty} \frac{1-6x}{1+5x}$

11.  $\lim_{x \rightarrow -\infty} \frac{e^x}{1-x^2}$

12.  $\lim_{y \rightarrow \infty} \frac{4y^4}{y^2+3}$

13.  $\lim_{x \rightarrow -\infty} \frac{-(x^2+3)}{(2-x)^2}$

14.  $\lim_{x \rightarrow \infty} \left[ 7 + \frac{2x^2}{(x+3)^2} \right]$

15.  $\lim_{x \rightarrow \infty} \frac{3x}{1-x}$

16.  $\lim_{x \rightarrow \infty} \frac{2x+1}{x^2-1}$

17.  $\lim_{x \rightarrow \infty} \left( 2 + \frac{1}{x} \right)$

18.  $\lim_{x \rightarrow \frac{\pi}{2}} \csc x$

19.  $\lim_{x \rightarrow \pi} \cos x$

20.  $\lim_{x \rightarrow -2} \frac{2x^3 + 7x^2 + 10x + 8}{x+2}$

21.  $\lim_{x \rightarrow \infty} \left( \sqrt{\frac{x^2 - 3x}{2x^2 + 5}} \right)$

22.  $\lim_{x \rightarrow \infty} \left( \frac{-3x^2}{x^2+2} + \frac{5x^3}{x^4} \right)$

**23-25, Find the limit from the left, from the right, and then the overall limit.**

23.  $\lim_{x \rightarrow 6} \frac{|x-6|}{x-6}$

24.  $\lim_{x \rightarrow 1} f(x)$ , where  $f(x) = \begin{cases} 2x+1, & x < 1 \\ 4-x^2, & x \geq 1 \end{cases}$

25.  $\lim_{x \rightarrow 16} \frac{4-\sqrt{x}}{x-16}$