

Review of Limits

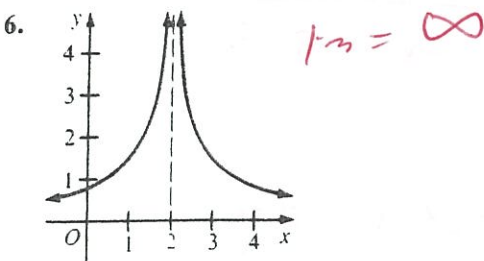
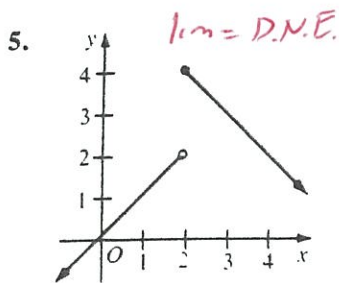
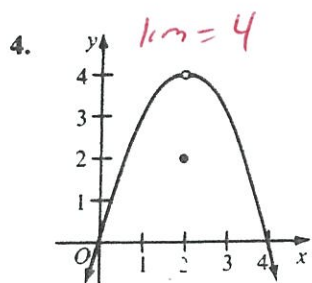
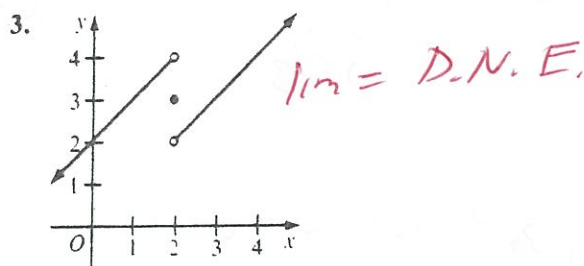
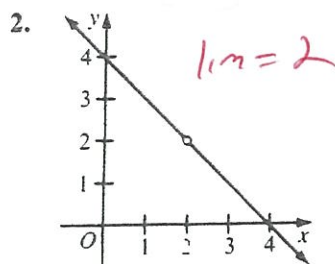
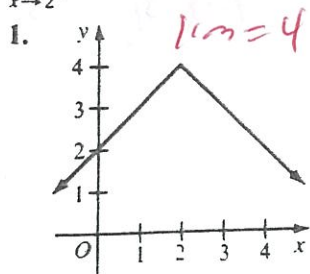
Name: Key

Date: _____

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I)

In Exercises 1-6 the graph of a function f is given. State whether or not $\lim_{x \rightarrow 2} f(x)$ exists and, if it does, give its value.



II) Find each limit:

7) $\lim_{x \rightarrow 2} (4x^3 + 5x + 9) = 32 + 10 + 9 = \boxed{51}$

8) $\lim_{x \rightarrow 0} \sqrt{x} = \boxed{\sqrt{2}}$

9) $\lim_{x \rightarrow \frac{1}{2}} \left(\frac{8x^2 + 4x - 3}{4x^2 - 2x + 6} \right) = \frac{2 + 2 - 3}{1 + 1 + 6} = \frac{1}{8} = \boxed{\frac{1}{8}}$

10) $\lim_{x \rightarrow 1} \frac{2x - 2}{x^2 + 3x - 4} = \frac{2(x-1)}{(x+4)(x-1)} = \frac{2}{x+4} = \frac{2}{5} = \boxed{\frac{2}{5}}$

11) $\lim_{x \rightarrow \sqrt{2}} (x^2 - 3)(x^2 - 4) = (-1)(-2) = \boxed{2}$

12) $\lim_{x \rightarrow 0} \left(\frac{x^3 + 8}{x^3 - 8} \right) = \frac{8}{-8} = \boxed{-1}$

13) $\lim_{x \rightarrow 2} \frac{4 + x^2}{2 - x} = \boxed{\text{D.N.E.}}$ $f(2) = -$, $f(1) = +$

14) $\lim_{x \rightarrow -1} \frac{1 - x^2}{1 + x} = \frac{(1-x)(1+x)}{1+x} = 1 - 1 = \boxed{0}$

15) $\lim_{x \rightarrow 1} \frac{1 - x}{x^2 - 1} = \frac{(1-x)}{(x+1)(x-1)} = \frac{-1}{x+1} = \frac{-1}{2} = \boxed{-\frac{1}{2}}$

16) $\lim_{x \rightarrow 3} \left(\frac{x^3}{x-3} - \frac{27}{x-3} \right) = \frac{(x+3)(x^2+3x+9)}{x-3} = \boxed{27}$

17) $\lim_{x \rightarrow 2} \frac{x^2 + x - 6}{x^2 - 4} = \frac{(x+3)(x-2)}{(x+2)(x-2)} = \frac{5}{4} = \boxed{\frac{5}{4}}$

18) $\lim_{n \rightarrow -\infty} \frac{n-1}{2n} = \frac{-1}{2} = \boxed{-\frac{1}{2}}$

19) $\lim_{n \rightarrow \infty} \frac{n^3 - 1}{2 + n^2} = \boxed{\infty}$

20) $\lim_{n \rightarrow \infty} \frac{6n^2 - 5n - 4}{8n^2 + n - 7} = \frac{6}{8} = \boxed{\frac{3}{4}}$

21) $\lim_{n \rightarrow -\infty} \frac{3n^2 - 5n + 2}{n + 2} = \pm \infty = \boxed{-\infty}$

22) $\lim_{x \rightarrow \infty} \frac{x+4}{3x^2-5} = \boxed{0}$

23) $\lim_{x \rightarrow -\infty} \frac{5x^3 - 12x + 7}{4x^2} = \frac{-}{+} \infty = \boxed{-\infty}$

24) $\lim_{x \rightarrow +\infty} \left(\frac{2}{x^2} - 4x \right) = 0 - \infty = \boxed{-\infty}$

25) $\lim_{x \rightarrow -\infty} \frac{\sqrt{x^2+4}}{x+4} = \frac{x}{-x} = \boxed{-1}$