

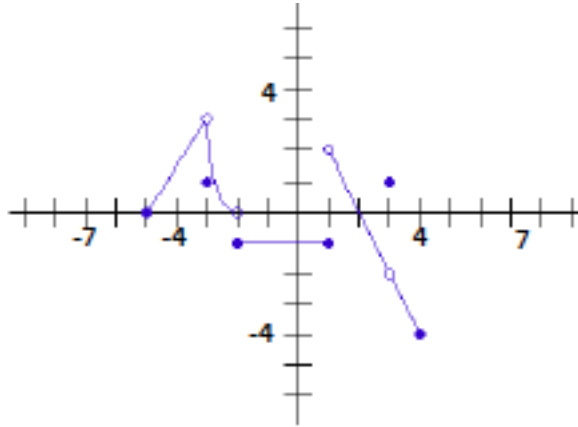
Your Name:

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## Worksheet: Limits at Continuity (Discontinuity)

**Note:** for all the problems, identify the limit as a number,  $-\infty$ ,  $\infty$  or DNE (does not exist)

1. Refer to the graph below



Determine if the following limits exists:

$$\lim_{x \rightarrow -3} f(x)$$

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

$$\lim_{x \rightarrow 0} f(x)$$

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

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

$$\lim_{x \rightarrow 3} f(x)$$

2. (a)  $\lim_{x \rightarrow c} (2x + 5) =$

(b)  $\lim_{t \rightarrow 6} 8(t - 5)(t - 7) =$

(c)  $\lim_{x \rightarrow 2} \frac{x+2}{x^2-5x+6} =$

(d)  $\lim_{x \rightarrow 0} \frac{x^3+(x+1)\ln(x+3)}{x^3-4} =$

(e)  $\lim_{x \rightarrow 4} x^{x+1} =$

(f)  $\lim_{x \rightarrow -2} e^{x+1} =$

(g)  $\lim_{x \rightarrow \frac{\pi}{4}} \sin(2x) =$

(h)  $\lim_{x \rightarrow \frac{\pi}{2}} \csc(x) =$

(i)  $\lim_{x \rightarrow -5} \frac{x^2+3x-5}{x+7} =$

(j)  $\lim_{x \rightarrow 2} \frac{e^x}{x+1} =$

(k)  $\lim_{x \rightarrow 3} \frac{x^2-3}{\ln e^x} =$

(l)  $\lim_{x \rightarrow 0} \sqrt[3]{x^4 + 2x^3 + 8} =$

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

(n)  $\lim_{x \rightarrow -1} e^{x^2} =$

(o)  $\lim_{x \rightarrow \frac{\pi}{6}} \frac{\tan(x)}{\cos(2x)} =$

3. (a) Find  $\lim_{x \rightarrow 5} \frac{2x^2-7x-15}{x-5}$

(b) Find  $\lim_{x \rightarrow 1} \frac{x^3-1}{x-1}$

4. (a) Find  $\lim_{x \rightarrow -2} \frac{x+2}{\sqrt{x+6}-2}$

(b) Find  $\lim_{x \rightarrow -1} \frac{\sqrt{x+10}-3}{x+1}$

5. (a) Find  $\lim_{x \rightarrow 0} \frac{x^2+8\sin(x)}{x}$

(b) Find  $\lim_{x \rightarrow 0} \frac{\tan(6x^2)+\sin^2(2x)}{x^2}$

6. (a) Find  $\lim_{y \rightarrow 0} \left( \frac{6}{y^2+y} - \frac{6}{y} \right)$

(b) Find  $\lim_{x \rightarrow 0} \frac{10\sin(2x)}{1-\cos(2x)}$