LIMITS & CONTINUITY (1.7 & 1.8) NAME____________________________

1. Find each limit. Include a table of values to illustrate your answer. Include two tables if you need to consider a two sided limit.

A. $\lim_{x \to 0} (1+x)^{1/x} =$

B. $\lim_{\theta \to 0} \frac{\sin(2\theta)}{\theta} =$

C. $\lim_{y \to \infty} \frac{\sqrt{y^2+2}}{5y-6} =$

D. $\lim_{t \to 1^+} \frac{|1-t|}{1-t} =$

2. Find each of these limits. Use the limits to sketch a graph. Be sure to include any asymptotes, holes, or other important characteristics.

$$f(x) = \frac{x-2}{|x|-2}$$

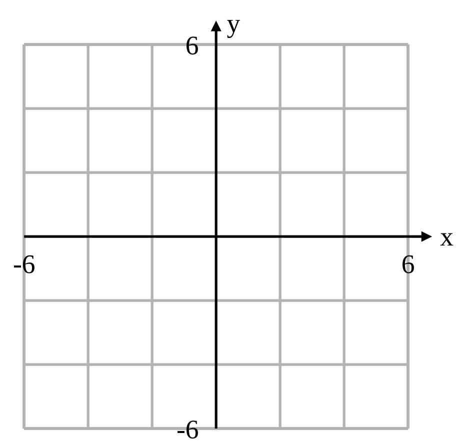
$\lim_{x \to -\infty} f(x) =$

$\lim_{x \to \infty} f(x) =$

$\lim_{x \to -2^-} f(x) =$

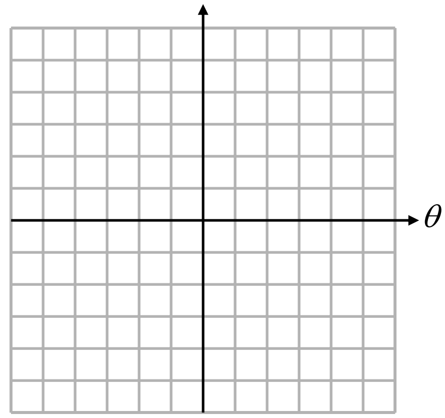
$\lim_{x \to -2^+} f(x) =$

$\lim_{x \to 2} f(x) =$



3. Find each of these limits. Use the limits to sketch a graph. Be sure to include any asymptotes, holes, or other important characteristics.

$g(\theta) = \ln|\sin\theta|$

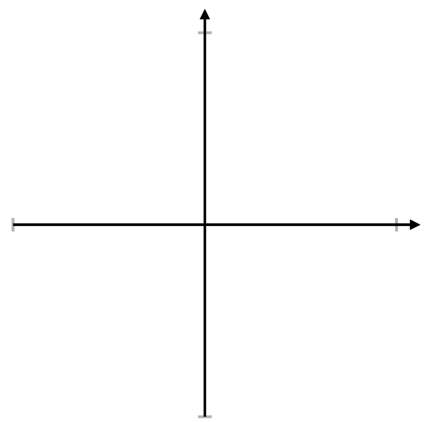


$\lim\limits_{\theta \to n\pi^+} g(\theta) =$ For $n = 0, \ \pm 1, \ \pm 2, \ \pm 3, \ \cdots$

$\lim\limits_{\theta \to n\pi^-} g(\theta) =$ For $n = 0, \ \pm 1, \ \pm 2, \ \pm 3, \ \cdots$

4. Find each of these limits. Use the limits to sketch a graph. Be sure to include any asymptotes, holes, or other important characteristics.

$h(r) = e^{-r}\cos(2r)$



$\lim\limits_{r \to -\infty} h(r) =$ $\lim\limits_{r \to \infty} h(r) =$

5. Find the value of k that would make the function continuous in each case.

A. $g(x) = \begin{cases} \dfrac{e^x - 1}{x} & x \neq 0 \\ k & x = 0 \end{cases}$

B. $h(x) = \begin{cases} \dfrac{\sin(5\pi x) - 1}{2x - 1} & x \neq \dfrac{1}{2} \\ k & x = \dfrac{1}{2} \end{cases}$

6. Find the value of *k* that would make the limit exist. Find the limit.

A. $\lim_{x\to\infty}\frac{2x^3-6}{x^k+3}$

B. $\lim_{x\to 2}\frac{x^2+kx-10}{x-2}$

7. In each case sketch a graph with the given characteristics.

A. $f(4)$ is undefined and $\lim_{x\to 4} f(x)=2$

B. $f(3)=2$ and $\lim_{x\to 3} f(x)$ does not exist.

C. $f(1)=3$ and $\lim_{x\to 1} f(x)=-2$