CALCULUS 12 **LIMITS AND CONTINUITY** Name:_____

THIS IS AN ADDITIONAL ASSIGNMENT DUE ON

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1. Find each limit. Show your work/reasoning. If you are using your graphing calculator, include a clear sketch of the function.

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.

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

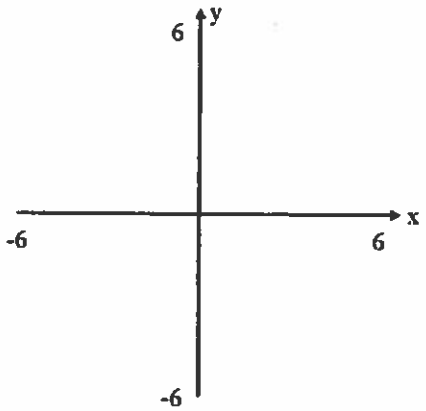
$\lim_{x\to-\infty} f(x) =$

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

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

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

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

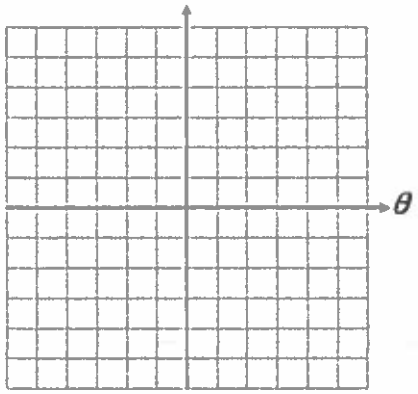


3. Find each of these limits. Use the limits to sketch a graph. Be sure to include any asymptotes, holes, or other important characteristics.

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

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

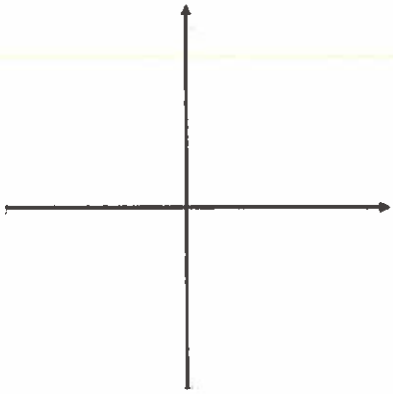
$\lim_{\theta \to n\pi^-} g(\theta) =$ For $n = 0, \pm 1, \pm 2, \pm 3, \cdots$



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

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

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



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 $\lim_{x\to 1} f(x)=-2$