CALCULUS 12 **Name:**_____

Date:_____

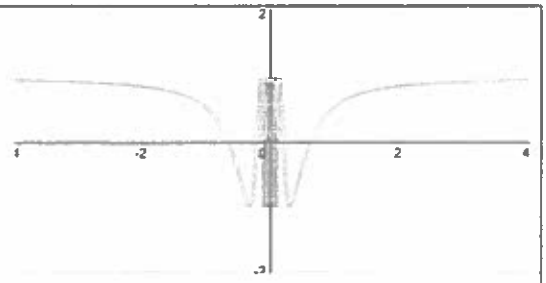
Limits and Continuity Test 1

/31

[4] **1.** Circle every function that has <u>a jump discontinuity</u>. You do not need to graph the function but you may find graphing helpful.

$f(x) = \frac{\lvert x \rvert}{x}$	$g(x) = \begin{cases} (x-1)^2, x \geq -1 \\ 2x - 1, x < -1 \end{cases}$	$h(x) = \begin{cases} 5, x > 0 \\ \frac{1}{2}x + 4, x \leq 0 \end{cases}$	$m(x) = \frac{x^2 + 3x + 2}{x + 1}$

[4] **2.** Identify what <u>type</u> of discontinuity each function has and determine whether discontinuity is <u>removable or not removable</u>. If the function has <u>no discontinuity, label it as continuous</u>.

$y = \frac{x^2 + 3x + 2}{x - 1}$	$f(x) = \frac{-2}{x^2}$	$g(x) = \lfloor x \rfloor$	

[3] **3.** What three conditions have to be met for a function f(x) to be continuous at x=c?

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[20] **4.** Evaluate each limit. If the limit does not exist, explain why.

a) $\lim_{x\to\infty} \frac{x^2-3x^3+5x-1}{4x^5+x^4-x+x^3} =$

b) $\lim_{x\to-\infty} \frac{|x|}{x} =$

c) $\lim_{x\to-5} 7 =$

d) $\lim_{x\to0} \frac{8\sin(x)}{x} =$

e) $\lim_{x\to0} \frac{1-\cos x}{5x} =$

f) $\lim_{x \to 8} \frac{x^2 - 11x + 24}{x - 8} =$

g) $\lim_{x \to 5} \frac{x}{x - 5} =$

h) $\lim_{x \to 4} \frac{\sqrt{x} - 2}{x - 4} =$

i) $\lim_{x \to \frac{\pi}{2}^-} \csc(2x) =$

j) $\lim_{x \to \frac{\pi}{4}} (2 + 3\cos(x)) =$