PRE-CALCULUS B 120

TEST : LIMITS ***NAME:*_____**

OCTOBER 2016

1. Evaluate each of the following limits, indicating if they do not exist. Clearly show all work! [32]

(a) $\lim_{h\to 1}\dfrac{2-\sqrt{h+3}}{h-1}$

(b) $\lim_{w\to\infty}\dfrac{\left(4w-3w^3\right)\left(2w^5-w\right)}{\left(w-5w^4\right)^2}$

(c) $\lim_{x\to 0}\dfrac{\sin^4 3x}{14x^4-12x^6}$

(d) $\lim_{x\to 0}\dfrac{\dfrac{1}{x+2}-\dfrac{1}{2}}{3x}$

(e) $\lim_{x \to -2w} \dfrac{(x-3w)^2 - 25w^2}{x+2w}$

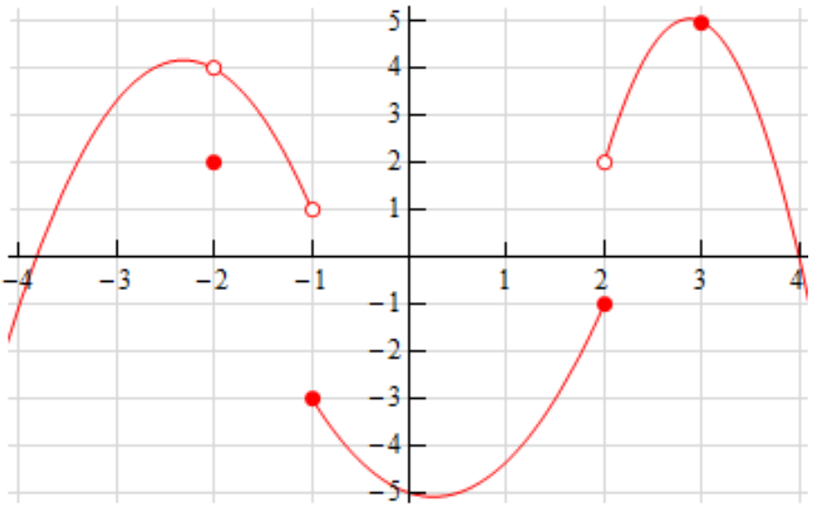
(f) $\lim_{x \to 0} \dfrac{\sqrt{3x+5} - \sqrt{5}}{\sin 5x}$

(g) $\lim_{x \to -4} \dfrac{x^3 + 64}{x^4 - 256}$

(h) $\lim_{x \to -5^-} \dfrac{|x+5|}{x^2 - 25}$

2. Use the graph provided to fill in the blanks below. [6]

Use does not exist (DNE) where appropriate.



(a) $f(-2) =$ _____

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

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

(d) $f(-1) =$ _____

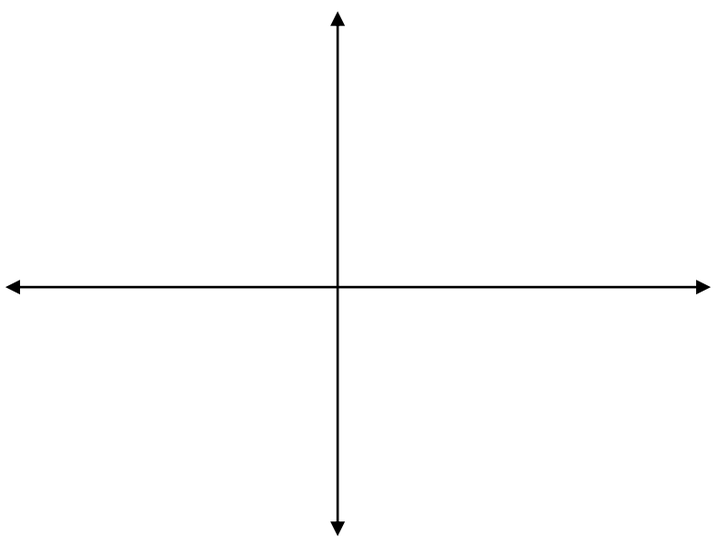
(e) $\lim_{x \to 2^+} f(x) =$ _____

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

3. Let $f(x) = \begin{cases} (x+2)^2 - 2 & , \quad if \quad x < -1 \\ -2 - x & , \quad if \quad -1 \le x < 2 \\ 0 & , \quad if \quad x = 2 \\ -(x-3)^2 - 3 & , \quad if \quad x > 2 \end{cases}$

(a) Check *f*(*x*) for any points of discontinuity. Clearly show your work for all continuity checks. Provide a mathematical reason to validate any point(s) where $f(x)$ is discontinuous. [6]

(b) Sketch *f*(*x*). [4]



4. Determine the equation of the ***normal*** to the curve $y = \frac{5}{x+6}$ at x = -1. [6]

5. Determine the coordinates of any point(s) on the function $f(x) = -3x^2 + x + 1$ where a tangent line would be **parallel** to the line $7x + y - 2 = 0$. [6]