Name: Richard

MATH 200 – Quiz 3

January 29, 2015

1. $\lim_{x\to 0} \frac{\tan(\pi x)}{2x} = \frac{1}{2} \lim_{x\to 0} \frac{\tan(\pi x)}{x} = \frac{1}{2} \lim_{x\to 0} \frac{\frac{\sin(\pi x)}{\cos(\pi x)}}{\frac{x}{1}} = \frac{1}{2} \lim_{x\to 0} \frac{\sin(\pi x)}{\cos(\pi x)} \frac{1}{x}$

$= \frac{1}{2} \lim_{x\to 0} \frac{\sin(\pi x)}{x} \frac{1}{\cos(\pi x)} = \frac{\pi}{2} \lim_{x\to 0} \frac{\sin(\pi x)}{\pi x} \frac{1}{\cos(\pi x)} = \frac{\pi}{2} \cdot 1 \cdot \frac{1}{\cos(\pi \cdot 0)}$

$= \frac{\pi}{2} \cdot 1 \cdot \frac{1}{1} = \boxed{\frac{\pi}{2}}$

has form $\frac{\sin(☁)}{☁}$ as $☁ \to 0$

2. Answer the following questions about the function $y = f(x)$ graphed below.

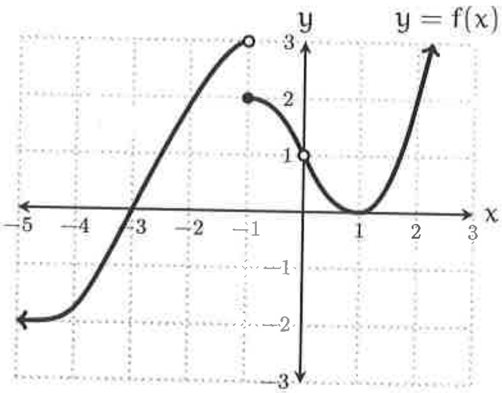
(a) $f(-1) = 2$

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

(c) $\lim_{x\to -1^-} f(x) = 3$

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

(e) $\lim_{x\to 0^+} f(x) = 1$



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January 29, 2015

1. $\lim_{x\to 1} \frac{\sin(x^2-1)}{x-1} = \lim_{x\to 1} \frac{\sin(x^2-1)}{x-1} \frac{x+1}{x+1} = \lim_{x\to 1} \frac{\sin(x^2-1)}{x^2-1} (x+1)$

$= \left(\lim_{x\to 1} \frac{\sin(x^2-1)}{x^2-1}\right) \cdot \left(\lim_{x\to 1} (x+1)\right) = 1 \cdot (1+1) = \boxed{2}$

has form $\frac{\sin(☁)}{☁}$ with $☁ \to 0$

2. Answer the following questions about the function $y = f(x)$ graphed below.

(a) $f(-1) = -2$

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

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

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

(e) $\lim_{x\to -4^+} f(x) = -1$