

Quiz 2, Sep 13th, 2012

Write your answers on this page. Continue on the back if you need more space.

(5 pts) 1. Evaluate the following limit, or state that it does not exist.

$$\lim_{t \rightarrow 5} \frac{4t^2 - 100}{t - 5}$$

$$= \lim_{t \rightarrow 5} \frac{4(t^2 - 25)}{t - 5} = \lim_{t \rightarrow 5} \frac{4(t+5)(\cancel{t-5})}{\cancel{t-5}}$$

$$= 4(5+5) = 40$$

(5 pts) 2. Evaluate $\lim_{x \rightarrow \infty} f(x)$ and $\lim_{x \rightarrow -\infty} f(x)$ for the following function. Then give the horizontal asymptotes of f if any.

$$f(x) = \frac{-x^3 + 1}{2x + 8}$$

$$f(x) = \frac{-\frac{x^3}{x} + \frac{1}{x}}{\frac{2x}{x} + \frac{8}{x}}$$

$$= \frac{-x^2 + \frac{1}{x} \rightarrow -\infty}{2 + \frac{8}{x} \rightarrow 0}$$

$$\lim_{x \rightarrow \pm\infty} \left(\frac{1}{x} \right) = 0$$

$$\lim_{x \rightarrow \pm\infty} -x^2 = -\infty$$

(% x^2 always positive)

$$\text{So } \lim_{x \rightarrow \pm\infty} f(x) = -\infty$$

Since $\lim_{x \rightarrow \pm\infty} f(x)$ DNE,

there are no horizontal asymptotes.