

Math 241: HW 4

Due on Friday, September 13

Fall '13

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Problem 1

Compute the following limits:

$$a) \lim_{x \rightarrow 0} \frac{\sin(\pi x)}{37x}$$

$$b) \lim_{x \rightarrow 0} \frac{\sin(4x)}{16 \sin(2x)}$$

$$c) \lim_{x \rightarrow 0} \frac{\tan^2(10x)}{\sec^2(5x)}$$

Problem 2

Compute the following limits:

$$a) \lim_{x \rightarrow 0^+} \frac{x - 15}{x}$$

$$b) \lim_{x \rightarrow 0^-} \frac{x - 15}{x}$$

$$c) \lim_{x \rightarrow 7^+} \frac{(x - 4)(x + 3)}{x + 7} \quad (\text{Hint: this is easy})$$

$$d) \lim_{x \rightarrow 7^+} \frac{(x - 4)(x + 3)}{x - 7}$$

Problem 3

Let $\alpha, \beta \in \mathbb{R}$ such that $0 < \alpha < \beta$. Consider the function

$$f(x) = \frac{x - \alpha}{x - \beta}.$$

what is $\lim_{x \rightarrow \beta^+} f(x)$? How about $\lim_{x \rightarrow \beta^-} f(x)$?