

Name: _____

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Worksheet week 4

Calculus I

Fall 2014

1. (3 pts) Find, if possible, a value for the constant k which will make the function $g(x)$ continuous everywhere.

$$g(x) = \begin{cases} \frac{1 - \cos(kx)}{x^2} & \text{if } x < 0 \\ 1 + \sin x & \text{if } x \geq 0 \end{cases},$$

2. (4 pts) True or False. Answer and briefly justify your answer in each case.

(a) If $|f(x) + 7| \leq 3|x + 2|$ for all real x , then $\lim_{x \rightarrow -2} f(x) = -7$.

(b) If $f(x)$ is continuous at $x = 2$ and $f(2) = 5$, then for x sufficiently close to 2, $f(x) > 4.95$.

3. (4 pts) (a) Use IVT to show that the equation $x^6 + 5x^3 = 1$ has a solution in the interval $(0, 1)$.

(b) Use IVT to locate another interval of length 1 which contains a solution of the equation $x^6 + 5x^3 = 1$.