Math 124 - Section 012
Quiz on 1.7

*Write clearly and **show all of your work.** Good luck.*

1. If possible, choose k so that the following function is continuous on any interval.

$$f(x) = \begin{cases} \frac{x^4-4}{x^2-2} & \text{if } x \neq \sqrt{2} \\ k & \text{if } x = \sqrt{2} \end{cases}$$

Answer: $k = 4$

2. A 2 mg dose of a drug is injected into a patient steadily (at a constant rate) for 3 seconds. At the end of this time, the quantity, Q, of the drug in the body starts to decay exponentially at a continuous rate of 0.3% per second. Using formulas, express Q as a function of time, t, in seconds. Is $Q(t)$ continuous? Sketch the graph of $Q(t)$.

Answer: $Q(t) = \begin{cases} \frac{2}{3}t & t \leq 3 \\ 2e^{-.003(t-3)} & t \geq 3 \end{cases}$

$Q(t)$ is continuous.