MTH 254 **HW #1** Fall 2013

1. Suppose the concentration ρ (in mg per liter) of a drug in the blood as a function of x, the amount (in mg) of the drug given, and t, the time (in hours) since the injection, is given by

$$\rho(x,t) = te^{-t(5-x)}$$

(a) Find $\rho(3,2)$. Give units, and interpret in terms of drug concentration.
Your answer should be a complete sentence, describing both inputs and outputs.

(b) Explain the significance of the following two single variable functions in terms of drug concentration.

$$\rho(4,t) \qquad\qquad \rho(x,1)$$

(c) What values do you think x can take? What about t?

2. Choose a function $f(x,y)$.

(a) Graph $z = f(x,y)$.

(b) Draw at least 4 level sets $\{f(x,y) = \text{constant}\}$.
Your level sets should be drawn on the same axes, and the spacing between them should be at least roughly correct. Label each level set with the corresponding value of f.