Quiz 8

1. For each part, pick the function that exhibits the specified behavior.

$f(x) = 10x$, $g(x) = 10^x$, $h(x) = log(x)$

a. If the input is increased by 1, the output is multiplied by 10. _____

b. If the input is multiplied by 10, the output is increased by 1. _____

c. If the input is increased by 1, the output is increased by 10. _____

2. Recall that the pH function is defined as

$$pH(H^+) = -\log(H^+)$$

where H^+ is the hydrogen ion concentration of a substance in $\frac{mol}{L}$. Recall also that the lower a substances pH, the more acidic it is.

An ulcer patient has been told to avoid acidic foods. If he drinks coffee, which has a pH of 5.0, it bothers him, but he can tolerate milk, which has a pH of 6.9.

a. Find the hydrogen ion concentration of coffee and the hydrogen ion concentration of milk.

b. The patient is told that he can tolerate foods with a pH of 6.0, but no lower. Can he tolerate a half coffee-half milk mixture? (Hint: The hydrogen ion concentration of the mixture will be the average of the two concentrations from part (a).)

3. Let $f(x) = x^2 - 9$.

a. What is the y-intercept?

b. What are the roots? (Hint: You don't need any special techniques or formulas for this.)

c. What is the vertex? (Hint: The x-coordinate of the vertex is halfway between the roots. You can then use the x-coordinate to find the y-coordinate.)

d. What is the equation of the axis of symmetry?