Quiz 28

Name: _____

1. Suppose a tissue sample has five billion healthy cells and two billion cancer cells. What is the proportion of cancer cells?

   The fraction is $\frac{2}{7} \approx 0.286$, or 28.6%.

2. In class we formulated a discrete dynamical system for the proportion p_t of one subpopulation in a two-population system, and we found the equation

$$p_{t+1} = \frac{2p_t}{2p_t + 1.5(1 - p_t)}$$

   (where I have inserted some parameter values). Write down the updating function $f(x)$ and compute its derivative. [You do not need to simplify your answer, but simplifying before taking the derivative may help.]

$$f'(x) = \frac{2x}{2x + 1.5(1-x)} = \frac{2x}{0.5x + 1.5}$$
$$= \frac{2(0.5x + 1.5) - 2x(0.5)}{(0.5x + 1.5)^2}$$