CHECK YOUR UNDERSTANDING.

EXAMPLE 1: For each of the following functions compute the derivative, $f'(x)$, and find $f'(1)$

a) $f(x) = 2 * 3^x$
b) $f(x) = 4e^x + \ln(x)$
c) $f(x) = 2x^3 + 3e^x$

EXAMPLE 2: Suppose that the amount of Caffeine, $C(t)$ in *mg*, in your bloodstream t hours after drinking a coffee is modeled by: $C(t) = 150 * (0.89)^t$. Find the rate at which the amount of caffeine in the bloodstream is changing one hour after drinking the coffee.

EXAMPLE 3: Suppose a population is changing at a rate of:

$$P(t) = 350(1.015)^t$$

where time is in years since 2010 and the population is in thousands.

a. What was the population in 2010?

b. What is the population in 2013?

c. How fast is the population changing in 2013?

EXAMPLE 4: Find the equation of the tangent line to $f(x) = 4e^x$ at $x = 0$

EXAMPLE 5: If $g(x) = ae^x - bln(x)$, where a and b are constant, find $g'(x)$