#1-13: Use the appropriate technique to find the derivative of the function below. (6 points each)

1) $f(x) = 4x^3 + 3x - 5$

2) $f(x) = \frac{5}{x^4}$

3) $f(x) = 16\sqrt{x}$

4) $f(x) = \frac{6x^2+4x}{2x}$

5) $f(x) = (3x + 5)(4x - 7)$

6) $f(x) = \frac{9x}{2x-7}$

7) $f(x) = 4(3x + 2)^3$

8) $f(x) = 6x(2x + 3)^2$

9) $f(x) = e^{9x+4}$

10) $f(x) = 5xe^{6x}$

11) $f(x) = \frac{x^2}{e^x}$

12) $f(x) = \ln(5x)$

13) $f(x) = 3xln(x)$

14) $f(x) = 3x^2 + 12x - 9;\ \ x = 2$ (3 points each part)

a) Find the slope of the tangent line to the graph of f(x) for the given value of x

b) Find the equation of the tangent line to the graph of f(x)for the given value of x.

15) $f(x) = e^{3x^2}$ (3 points for each part)

a) Find all values of x where the tangent line to the graph of f(x) is horizontal.

b) Find the equation of the tangent line to the graph of the function for the values of x found in part a.

16) Bob's company determines the profit function for producing and selling a certain product can be modeled by: $P(x) = -0.8x^2 + 20x$

Where x represents the number of units of the product sold and P(x) represents the monthly profit in dollars. (2 points for each part)

Find the following:

a) P(4) b) Explain using words what your answer to part **a** means.

c) Find $P'(x)$ (This is the marginal profit function)

d) Find $P'(4)$ e) Explain using words what your answer to part **d** means