Pre Calc BC **6- Linearization** **Name:**

1. Find derivatives of the functions below:

a) $y = \ln(5x)$ b) $y = 3x - 2\cos x$ c) $y = 7e^x + 9$ d) $y = x^{\pi}$

e) $y = \ln x^3$ f) $y = (2x-3)^2$ g) $y = \left(x + \frac{1}{x}\right)^2$ h) $y = \sin^2 x + \cos^2 x$

2. Write the equations of the tangent lines for each of the following functions when x = 2. Verify by graphing the function and your equation of the tangent.

a) $y = 0.5x^2$ b) $y = x^3 - x^2$ c) $y = 5 - x^2$ d) $y = 4/x^2$

3. Let $f(x) = \sqrt[3]{x}$.

a) Find $f'(x)$

b) Write the equation of the tangent at x = 27

c) Use your equation of the tangent to estimate $\sqrt[3]{28}$ (ie. plug x=28 into your *line)*

4. Find the y-intercept of the line tangent to $y = 1/x^2$, at x = 1.2

5. Use linearization to approximate sin(□/7).

a) Write the equation for the tangent to $y = \sin x$ at x = □/6

b) Use the linear equation to approximate sin(□/7)

c) Verify your result with your calculator.