PS 3 Due Friday 10/19
Honor Code Certification:

Your signature_____

Show your steps. and work on another piece of paper. Each question is scored: 2 points for the correct answer; 3 points for the correct work. Partial credit may be awarded.

Solve.

1) $x^2 + 2y^2 = 11$
$x - y = 3$

Solve the exponential equation. Round to three decimal places when necessary.

2) $e^x + e^{-x} = 4$

Find the average rate of change of the function over the given interval.

3) $h(t) = \sin(3t), \left[0, \frac{\pi}{6}\right]$

Solve, finding all solutions. Rember to use the "k" expression.

4) $2\tan^2 x - 3\sec x = 0$

Solve the logarithmic equation.

5) $\ln(5x - 1) = \ln 6 - \ln(x - 6)$

Solve.

6) $4x^3 - 15x^2 \le 25x$

Find the value of the constant k that makes the function continuous.

7) $h(x) = \begin{cases} \dfrac{7x^2 + 25x - 12}{x + 4} & \text{if } x \ne -4 \\ 4x + k & \text{if } x = -4 \end{cases}$

Find the slope of f(x) at the given value of x. Make sure to write a limit expression. Use one of the definitions of the derivative

8) $f(x) = \dfrac{-1}{x + 6}; \quad x = -4$

Find the values of x where the piecewise defined function is NOT continuous or NOT differentiable. Identify the types of discontinuities.

9)

$$f(x) = \begin{cases} e^{-x} - 5, & \text{for } x < -2, \\ x - 1, & \text{for } -2 \le x < 1 \\ x^3, & \text{for } x \ge 1 \end{cases}$$

Find the limit, if it exists.

10) $\lim_{x \to 0} \dfrac{\sqrt{1+x}-1}{x}$