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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.

$$\begin{aligned} 1) \quad & x^2 + 4y^2 = 10 \\ & x - y = -3 \end{aligned}$$

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

$$2) \quad e^x + e^{-x} = 7$$

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

$$3) \quad h(t) = \sin(2t), \left[0, \frac{\pi}{4}\right]$$

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

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

Solve the logarithmic equation.

$$5) \quad \ln(4x - 3) = \ln 15 - \ln(x - 5)$$

Solve.

$$6) \quad 3x^3 - 8x^2 \leq 16x$$

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

$$7) \quad h(x) = \begin{cases} \frac{4x^2 + 9x - 9}{x + 3} & \text{if } x \neq -3 \\ 4x + k & \text{if } x = -3 \end{cases}$$

Find the slope of  $f(x)$  at the given value of  $x$ . Make sure to write a limit expression. Use the thechnique from Sec 2.4

$$8) \quad f(x) = \frac{1}{x + 5}; \quad x = -3$$

Find the values of  $x$  where the piecewise defined function is NOT continuous and identify the types of discontinuities.

$$9) \quad f(x) = \begin{cases} e^{-x} - 7, & \text{for } x < -2, \\ x - 3, & \text{for } -2 \leq x < 1 \\ x^3, & \text{for } x \geq 1 \end{cases}$$

Find the limit, if it exists.

$$10) \quad \lim_{x \rightarrow 0} \frac{\sqrt{1+x} - 1}{x}$$