Name:

Directions: Complete all question and **show all applicable work.** Partial credit will be given. All questions are equally weighted (10pts each).

1.) Solve the equation for x:
$$3^x = 27$$

2.) Solve the equation for x:
$$\log_3 x = 4$$

3.) Evaluate $\log_2 \frac{1}{4}$.

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4.) Solve the equation for x:
$$10^{x-3} = 6.$$

5.) Simplify: $\ln(e^{2x})$.

6.) Create three individual plots, one for each of the following. Be sure to label one point on each graph and any asymptotes.

a.) $\ln(x)$

b.) $\ln(x - 3)$

c.) $-2\ln(x - 3)$

7.) John brings his bike to a pawnshop for some temporary cash. He is loaned \$600. One month later he returns and pays \$750 to fulfill the loan and have his bike returned.

a.) How much interest is charged?

b.) If interest is compounded continuously, what was the annual interest rate charged by the pawnshop as a percentage?

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8.) Write the following in expanded form:

$$\log_3 \left(\frac{x^4}{(x-2)(x-5)^7} \right)$$

9.) Solve the following for x:

$$\log_3 9x + \log_3 x = 6$$

10.) Compute $\log_5 12$.