City Semester Name:_____

Test on Logarithms

Show all work for full credit.

1. Let $x = \log A$ and $y = \log B$. Write the following expressions in terms of x and y.

   (a) $\log(A^2B^2)$

   (b) $\log(A^3\sqrt[3]{B})$

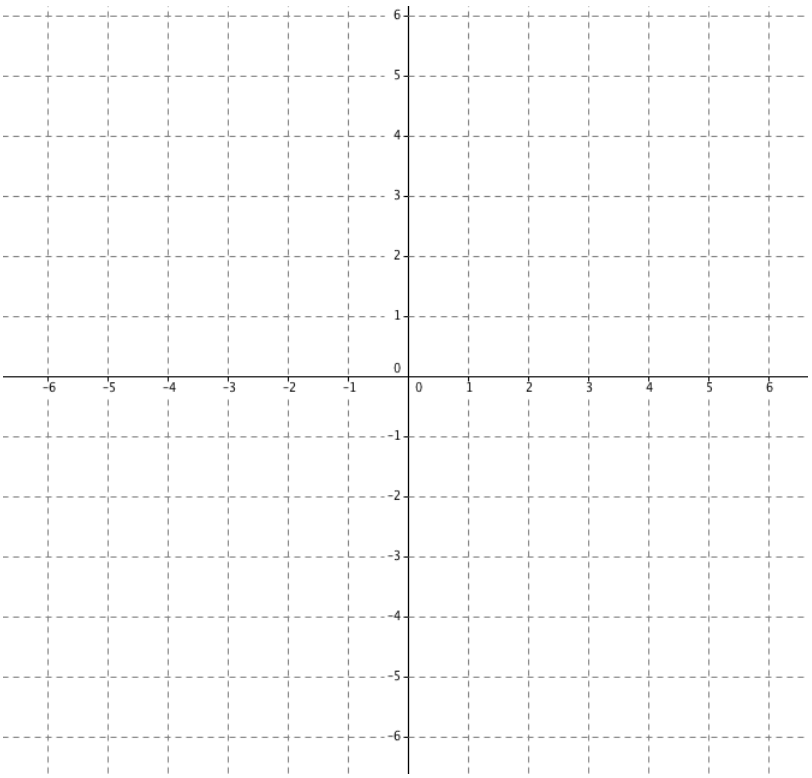
   (c) $\log\left(\dfrac{\sqrt{A}}{B^2}\right)$

2. A population doubles in size every 12 years.

   (a) Assuming the growth is exponential find the annual percentage growth rate of the population.

   (b) Assuming the growth is exponential find the continuous growth rate.

3. Give a sketch of $f(x) = \ln(x-3)+1$. Give the domain and range of each function, and the equations of any asymptotes.



4. Evaluate each expression without the use of a calculator. Show all steps of your reasoning.

   (a) $\log_3 \sqrt{27}$

   (b) $\log_2 80 - \log_2 10$

   (c) $\log_8 4$

   (d) $\log_6 4 + \log_6 9$

5. Solve for x.

(a) $\log(2x + 4) = 5$

(b) $e^{2x-1} = 5$

(c) $10^{x+3} = 6^{2x}$

(d) $400e^{0.1x} = 500e^{0.08x}$

6. The half life of palladium-100 is 4 days. After 20 days a sample has reduced to a mass of 0.375 grams.

   (a) What was the initial mass of the sample of palladium-100?

   (b) Give the function that models the mass of palladium-100 remaining after t days.

   (c) What is the mass after 3 days?

   (d) After how many days does only 0.15g of the sample remain?

7. Please write out the following statement and sign your name to it as testament to its truth. 'I have worked on this assignment for at most 60 minutes and I have neither given nor received any unauthorized help on this work'