162 Test 1   Name: _____

Write the following in equivalent logarithmic form:

   1. $2^5 = 32$ 3. $(1.005)^{12t} = 2$

   2. $10^{-4} = .0001$ 4. $e^{-.03t} = .25$

    Write the following in equivalent exponential form:

   5. $\log_4(8) = \frac{3}{2}$ 7. $\ln(x) = 3$

   6. $\log(0.1) = -1$ 8. $3\ln(x) - \ln(x^2) = 2$
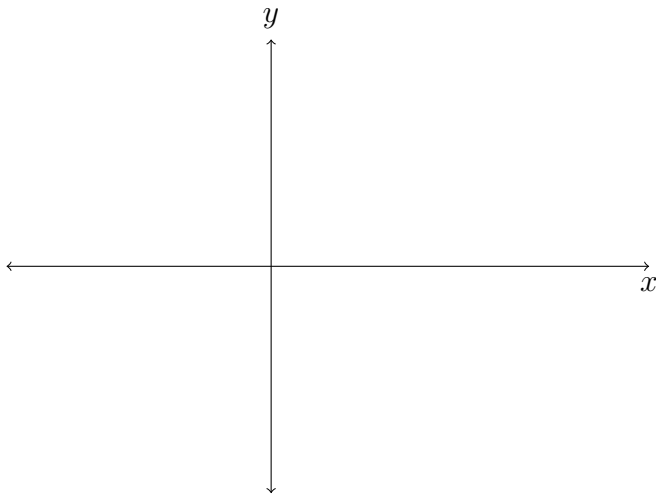
    Solve for t. Round your answer to 3 decimal places:

   9. $e^{-.03t} = .25$ 10. $(1.005)^{12t} = 2$

11. The domain of $\ln(x)$ is _____ and the range is _____

12. The domain of e^x is _____ and the range is _____

13. Graph $y = e^x$ and $y = \ln(x)$.

14. What is $\ln(e^\pi)$? Please give an exact answer, not a decimal.

15. Explain in clear English how you got the answer to the previous problem.

16. Solve for x: $\log_2(x) + \log_2(x - 3) = 2$

First rewrite as a single logarithm, then rewrite in equivalent exponential form, and solve. Do not forget to check your answers.

17. To decrease a number by 10% multiply by what number?

18. The value of your car decreases by 10% per year. If its present value is $5000.00 what will it be worth in 3 years?

19. When will it be worth $1,000?

20. A population of bacteria is observed to double every 4 hours. If the inital population is 50, what will it be in 10 hours?

21. When will the population be 2,000?

22. You invest at 6% compounded monthly. How many years before your money doubles?

23. A certain element is known to decay exponentially. Find the model for the decay

$$P(t) = P_0 e^{rt}$$

if $P(0) = 100$ and $P(20) = 75$

24. Find the inverse of the function

$$f(x) = 3 - 4e^{\frac{x}{2}}$$