MAT 133 Chapter 6 Review Name_____

Make any required rounding appropriate to at least 3 decimal places.

Rewrite each in exponential form.

1. $\log_2 64 = 6$
2. $\log_4 \frac{1}{64} = -3$
3. $\log 100 = 2$
4. $\ln x = 5$

Rewrite each in logarithmic form.

5. $2^5 = 32$
6. $5^{1/2} = \sqrt{5}$
7. $e^{3x} = y$

Evaluate each expression by hand.

8. $\log_3 3 =$
9. $\log_6 36 =$
10. $\ln 1 =$
11. $\log_8 \frac{1}{8} =$
12. $\log_4 4^{12} =$
13. $\log 1000 =$
14. $\log(0.01) =$

Evaluate each expression <u>by using a calculator*.</u>

15. $\log\ 1077 =$
16. $\ln(0.65) =$
17. $\log_7 60$ *Change to base 10 or e* = _____ =
18. $\log_3(-1.73) =$

Expand each expression into multiple logarithms.

19. $\log_6(3x)$
20. $\log(xy^2)$
21. $\ln(\frac{ab}{\sqrt{3}})$

Condense each expression into a single logarithm.

22. $\log_3 7 - \log_3 x$
23. $3\ln x - 2\ln y$
24. $\log_7 4 + 2\log_7 x - \log_7 5$

Solve each equation for x. <u>Check that each solution works in the original equation.</u>

25. $2\log_4 5 = \log_4 x$

26. $3\log_5 2 + \log_5 x = \log_5 24$

27. $\log(2x - 1) + \log 3 = 1$

28. $\ln(x + 14) - \ln x = \ln(x + 6)$

29. $4^{x-1} = 16$

30. $e^{3x} = 4$

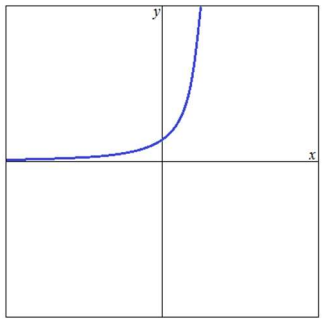
Match to the correct graph.

31. _____ $y = 4^x$

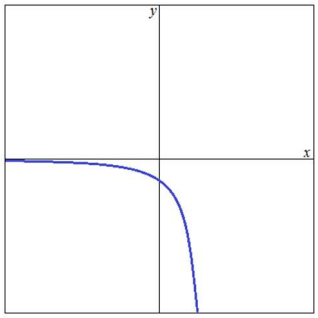
32. _____ $y = 2\left(\frac{1}{4}\right)^x$

33. _____ $y = -3(6)^x$

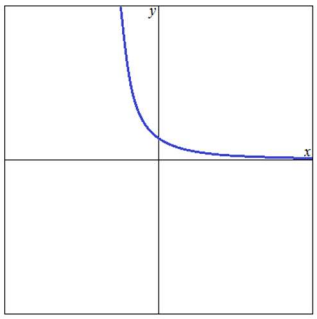
A.



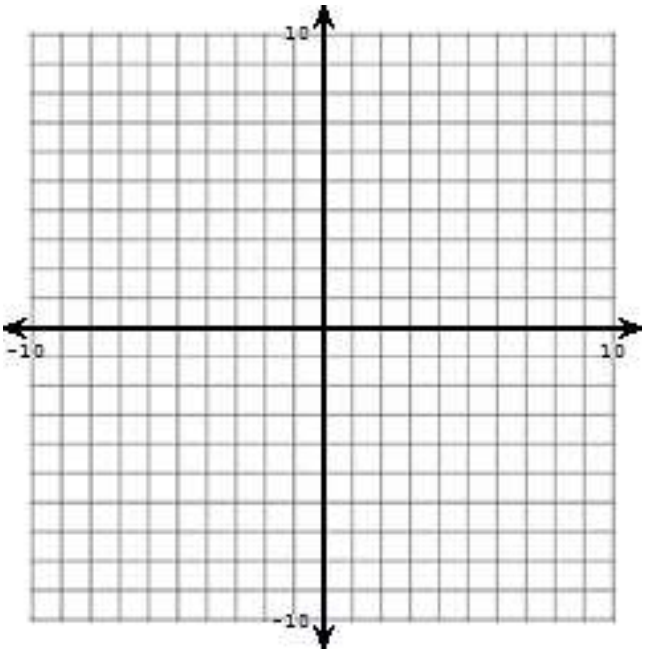
B.



C.



34-36 Given: $\boldsymbol{f(x) = 2(3)^x}$



34. Find $f(0) =$ _____ $f(1) =$ _____

$f(-1) =$ _____

35. Sketch the graph of the function f.

36. Find the inverse: $\boldsymbol{f^{-1}(x)} =$ _____ **,**

and, using a different color, sketch the graph of $\boldsymbol{f^{-1}(x)}$

by plotting 3 points you should already know.

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37. Find the inverse function: $y = \log_6(3x)$

38. a) Write the formula for a half-life function where the initial amount $A(0) = 200$mg, and the half-life is 16 years.

b) How much remains after 10 years?

c) How long until only 20mg remains?

39. The number of bacteria, after being introduced to a sample environment for 2 days, is 430, and after 4 days, the number is 7500. How many bacteria were initially introduced to the sample environment?

40. a) Write the formula for interest compounded *monthly*, with an interest rate of 6.5%.

b) How long would it take for an investment to double in this account?