

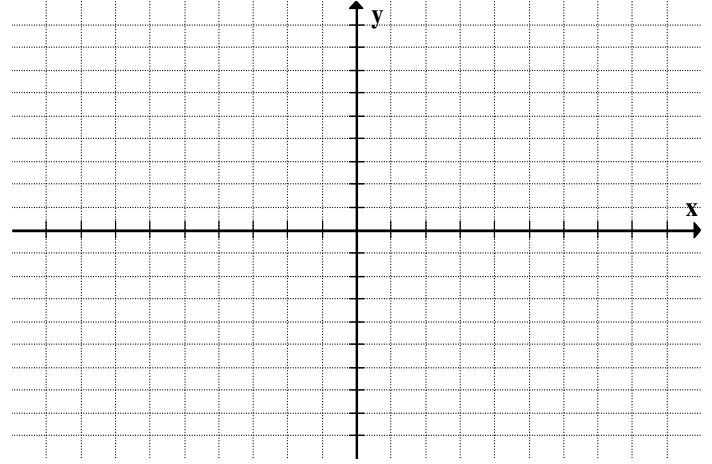
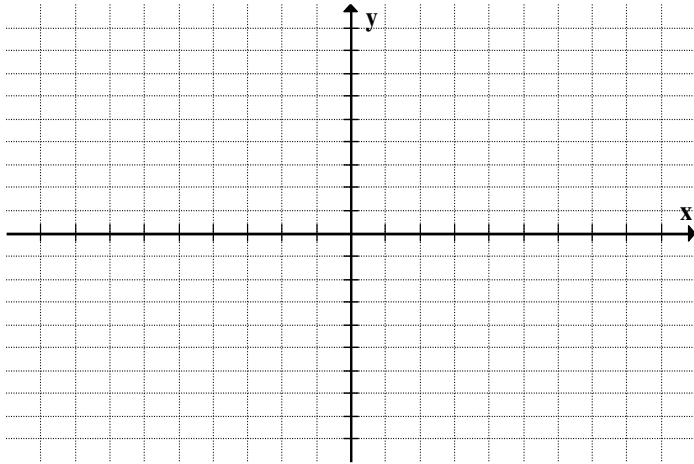
Pre-Calculus Unit 4 Practice Test

Learning Target 4A—I can graph and describe transformations for exponential functions.

1. Graph the following functions and describe the transformation(s) for $f(x) = 3^x$.

a. $f(x) = \frac{1}{3}(3^x)$

b. $f(x) = 3^x + 2$



2. Write the equation for $f(x) = 6^x$ that undergoes the following transformations:

- Shifted left 3 units,
- 4 units down,
- and reflected across the x -axis.

3. Write the equation for $f(x) = 3^x$ that undergoes the following transformations:

- Shifted right 2 units,
- 3 units up,
- and reflected across the x -axis.

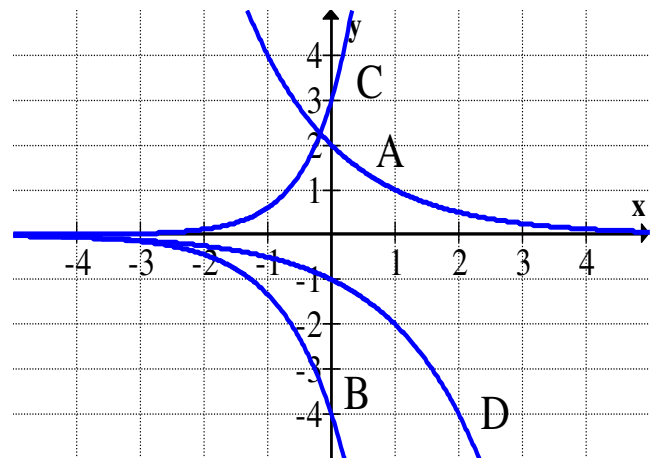
If all of the graphs below have equations with the form $f(x) = ab^x$

4. Which graph has the smallest a value?

5. Which graph has the largest a value?

6. Which graph has the smallest b value?

7. Which graph has the largest b value?



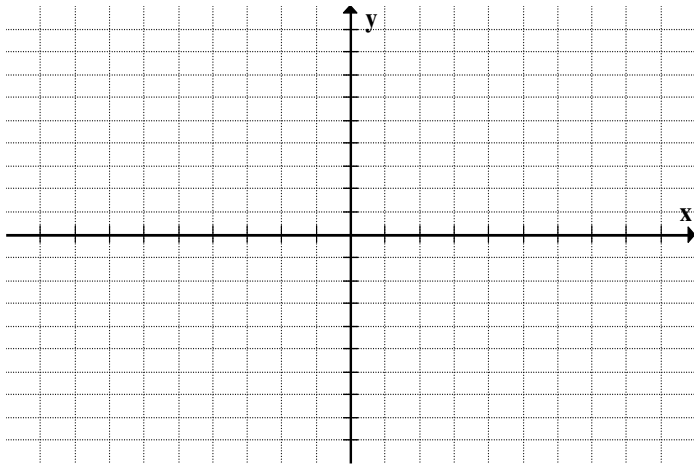
Learning Target 4B—I can graph and describe transformations for logarithmic functions.

8. Describe the transformations that change $f(x) = \log_3 x$ to $g(x) = \log_3(x - 4) + 7$.

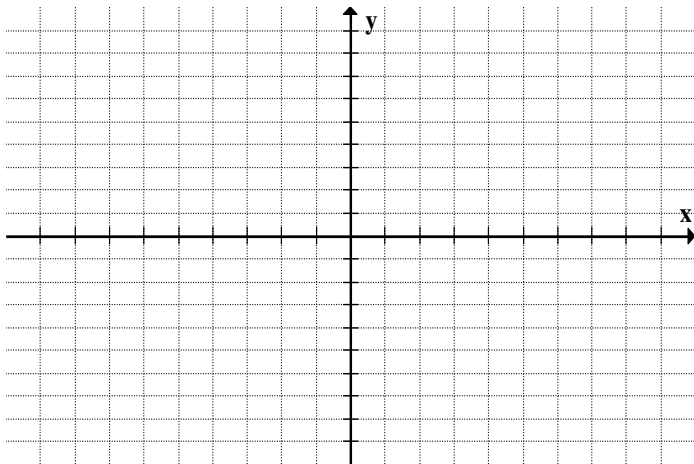
9. Describe the transformations that change $f(x) = \log_2 x$ to $g(x) = -2\log_2(x + 2) - 3$.

10. Find the domain and vertical asymptote of $f(x) = \log(3x + 1)$.

11. Graph $f(x) = \log_2(x - 1) + 2$. Describe the transformation(s) from $\log_2 x$.



12. Graph $f(x) = \log_3(x) - 3$. Describe the transformation(s) from $\log_3 x$.



Learning Target 4C—I can solve problems involving exponential functions.

13. Given the function $f(x) = 3(0.5)^x$, does $f(x)$ represent exponential growth or decay? Explain how you know.
14. Given the function $f(x) = -2(1.2)^x$, does $f(x)$ represent exponential growth or decay? Explain how you know.
15. Write the exponential function that passes through the points $(0, 5)$ and $(4, 405)$. Show your algebraic steps to find the function.
16. Write the exponential function that passes through the points $(2, 2)$ and $(4, 8)$. Show your algebraic steps to find the function.
17. Solve $216^{x-5} = 36^{x+2}$ for x .
18. Solve $8 + 3^{2x+1} = 35$
19. Solve $5^x = \frac{1}{625}$
20. Determine whether the following table could represent an exponential function. Explain your reasoning.

x	0	1	2	3
y	1	2	4	8

Learning Target 4D—I can solve problems involving logarithmic functions.

Solve the following for x .

21. $\log_3 \sqrt{x-2} = 2$

22. $5 + \ln(0.02x) = -5$

23. $\log(x+4) - \log(x) = 2 \log 3$

24. $\log_2(x+3) + \log_2(x+1) = 3$

25. Evaluate $\log_4 12$.

26. Evaluate $\log_{\frac{1}{3}} 26$.

27. Write the expression as a single logarithm.

a. $2 \log_3 x + 4 \log_3 y - 3 \log_3 z$

b. $4 \log_x w + 6 \log_x y$

28. Write the expression as the sum or difference of logarithms with no exponents

a. $\log_2 \left(\frac{x^2}{a^2 b^3} \right)$

b. $\log_2((x-2)^5(4x)^3)$

29. Calculate the number of years necessary for \$250 to grow to \$750 at 4.3% compounded continuously. Use the compound interest formula: $A=Pe^{rt}$, where A = final amount, P = starting amount, r = interest rate, and t = time in years. Show your work and round your answer to the nearest tenth.