

# 6 Practice Test WITH CalcChat®



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Graph the equation. Find the domain, range, and asymptote.

1.  $y = \left(\frac{3}{4}\right)^x$

2.  $y = \log_{2/3} x$

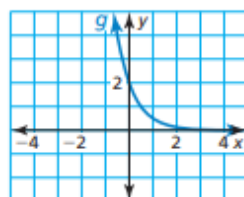
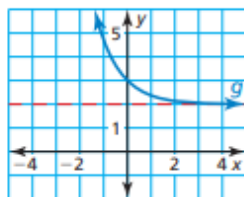
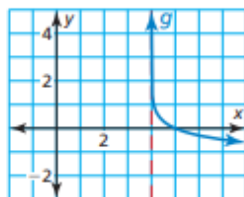
3.  $y = 4e^{-2x}$

Describe the transformation of  $f$  represented by  $g$ . Then write a rule for  $g$ .

4.  $f(x) = \log x$

5.  $f(x) = e^x$

6.  $f(x) = \left(\frac{1}{4}\right)^x$



Use  $\log_3 4 \approx 1.262$  and  $\log_3 13 \approx 2.335$  to evaluate the logarithm.

7.  $\log_3 52$

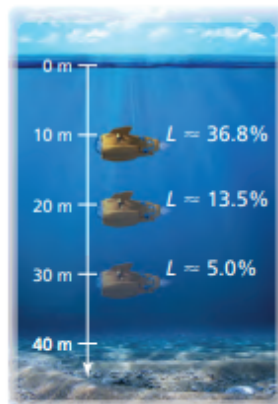
8.  $\log_3 \frac{13}{9}$

9.  $\log_3 16$

10.  $\log_3 8 + \log_3 \frac{1}{2}$

11. The percent  $L$  of surface light that filters down through a particular body of water can be modeled by the exponential function  $L(x) = 100e^{-0.1x}$ , where  $x$  is the depth (in meters) below the surface.
- Determine whether the model represents *exponential growth* or *exponential decay*. Explain your reasoning.
  - Find the percent of surface light available at a depth of 40 meters.
12. Without calculating, determine whether  $\log_5 11$ ,  $\frac{\log 11}{\log 5}$ , and  $\frac{\ln 11}{\ln 5}$  are equivalent expressions. Explain your reasoning.
13. The table shows the values  $y$  (in dollars) of a video game console  $x$  years after it is purchased. Describe three different ways to find an exponential model that represents the data. Then write and use a model to determine when the console is worth \$150.

|            |     |        |        |        |        |
|------------|-----|--------|--------|--------|--------|
| Year, $x$  | 0   | 2      | 4      | 6      | 8      |
| Value, $y$ | 250 | 202.50 | 164.03 | 132.86 | 107.62 |



14. Consider functions  $f$  and  $g$ . Solve  $f(g(x)) = g(f(x))$ . Justify your answer.

$$f(x) = 2(3)^x$$

$$g(x) = 4x$$

15. The amount of oil and gas (in billions of barrels of oil equivalent) discovered after drilling  $x$  wells in a region can be modeled by  $f(x) = 3.4 \ln x - 14.3$ , where  $0 \leq x \leq 3000$ .
- About how much oil and gas were discovered after drilling 1000 wells?
  - Find the inverse of the given function. Describe what the inverse represents.