

1. Explain (or show) how to evaluate the logarithm without using a calculator.

a.  $\log_4 16$

b.  $\log_5 1$

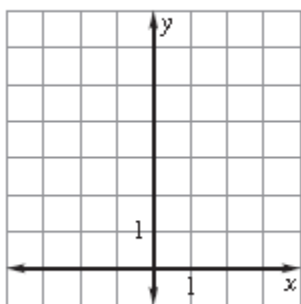
c.  $\log_3 \frac{1}{9}$

2. Rewrite the equation in exponential form.  $\log_4 \frac{1}{64} = -3$

3. Rewrite the equation in log form.  $5^2 = 25$

Graph the function. State the domain and range. Identify at least two points.

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

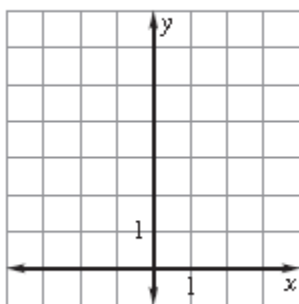


Domain:

Range:

Points:

5.  $y = \left(\frac{2}{5}\right)^x$

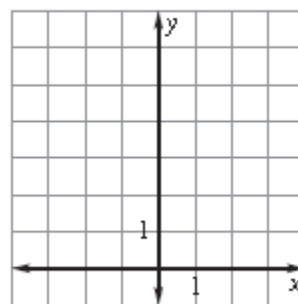


Domain:

Range:

Points:

6.  $f(x) = \left(\frac{3}{5}\right)^x + 1$



Domain:

Range:

Points:

Simplify the expression.

7.  $3e^4 \cdot e^3$

8.  $(-4e^{3x})^5$

9.  $\frac{e^{4x}}{5e}$

10.  $\frac{8e^{5x}}{6e^{2x}}$

11. From 1997 to 2001, the number  $n$  (in millions) of black-and-white TV's sold in the U.S. can be modeled by  $n = 26.8 (0.85)^t$  where  $t$  is the number of years since 1997.

- Identify the decay factor:
- Identify the percent decrease:
- Estimate the number of TV's sold in 1999:

12. You deposit \$1300 in an account that pays 4.4% annual interest. Find the balance after 6 years if...

- The interest is compounded monthly:
- The interest is compounded continuously:

13. Find the inverse of the function.

a.  $y = \log_4(x - 6)$

b.  $y = \ln(x + 10)$

c.  $y = 2^x - 3$

14. The *apparent magnitude* of a star is a measure of the brightness of the star as it appears to observers on Earth. The apparent magnitude  $M$  of the dimmest star that can be seen with a telescope is given by the function

$$M = 5 \log D + 2$$

where  $D$  is the diameter (in millimeters) of the telescope's objective lens. If a telescope has a diameter of 100 millimeters, what is the apparent magnitude of the dimmest star that the telescope can reveal?