

Identify each function as linear, quadratic, or exponential.

1.  $f(x) = \frac{x}{2} + 3^2$

2.  $f(x) = (6^{3x})^2$

3.  $f(x) = (x-2)(x+3)$

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

Tell whether each function represents exponential growth or decay.

5.  $y = 2(0.1)^x$

6.  $y = 3\left(\frac{1}{6}\right)^{-x}$

7.  $y = \left(\frac{5}{6}\right)^x$

Rewrite each equation in logarithmic form.

8.  $\left(\frac{1}{4}\right)^3 = \frac{1}{64}$

9.  $5^{-2} = \frac{1}{25}$

Rewrite each equation in exponential form.

10.  $\log_3 243 = 5$

11.  $\log_{125} 5 = \frac{1}{3}$

Find the value of  $v$  in each equation. Show your steps to justify your answers.

12.  $v = \log_3 3$

13.  $2 = \log_7 v$

14.  $\log_v \frac{1}{16} = -2$

### Looking ahead to the next unit

A virus contains a bacterium that grows at a rate of 15% per decade. Presently the virus contains 6000 bacteria. Find the number of bacteria for each given time. You must show work to receive credit.

a. 30 years from now

b. 5 years ago

c. If a virus becomes an epidemic when the count reaches 1,000,000, when will the virus be classified as an epidemic? You must show your work.