

## 7-2 Practice

### Solving Exponential Equations and Inequalities

Solve each equation.

1.  $4^{x+35} = 64^{x-3}$

2.  $\left(\frac{1}{64}\right)^{0.5x-3} = 8^{9x-2}$

3.  $3^{x-4} = 9^{x+28}$

4.  $\left(\frac{1}{4}\right)^{2x+2} = 64^{x-1}$

5.  $\left(\frac{1}{2}\right)^{x-3} = 16^{3x+1}$

6.  $3^{6x-2} = \left(\frac{1}{9}\right)^{x+1}$

Write an exponential function for the graph that passes through the given points.

7. (0, 5) and (4, 3125)

8. (0, 8) and (4, 2048)

9.  $\left(0, \frac{3}{4}\right)$  and (2, 36.75)

10. (0, -0.2) and (-3, -3.125)

11. (0, 15) and  $\left(2, \frac{15}{16}\right)$

12. (0, 0.7) and  $\left(\frac{1}{2}, 3.5\right)$

Solve each inequality.

13.  $400 > \left(\frac{1}{20}\right)^{7x+8}$

14.  $10^{2x+7} \geq 1000^x$

15.  $\left(\frac{1}{16}\right)^{3x-4} \leq 64^{x-1}$

16.  $\left(\frac{1}{8}\right)^{x-6} < 4^{4x+5}$

17.  $\left(\frac{1}{36}\right)^{x+8} \leq 216^{x-3}$

18.  $128^{x+3} < \left(\frac{1}{1024}\right)^{2x}$

19. At time  $t$ , there are  $216^{t+18}$  bacteria of type A and  $36^{2t+8}$  bacteria of type B organisms in a sample. When will the number of each type of bacteria be equal?