

8-2 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?