

8. $\log_{81} x = \frac{3}{4}$

9. $\log_{25} x = \frac{5}{2}$

10. $\log_8 \frac{1}{2} = x$

11. $\log_6 \frac{1}{36} = x$

12. $\log_x 32 = \frac{5}{2}$

13. $\log_x 27 = \frac{3}{2}$

14. $\log_3 (3x + 8) = \log_3 (x^2 + x)$

15. $\log_{12} (x^2 - 7) = \log_{12} (x + 5)$

16. $\log_6 (x^2 - 6x) = \log_6 (-8)$

17. $\log_9 (x^2 - 4x) = \log_9 (3x - 10)$

18. $\log_4 (2x^2 + 1) = \log_4 (10x - 7)$

19. $\log_7 (x^2 - 4) = \log_7 (-x + 2)$

Solve each inequality.

22. $\log_6 x < -3$

23. $\log_4 x \geq 4$

24. $\log_3 x \geq -4$

25. $\log_2 x \leq -2$

26. $\log_5 x > 2$

27. $\log_7 x < -1$

28. $\log_2 (4x - 6) > \log_2 (2x + 8)$

29. $\log_7 (x + 2) \geq \log_7 (6x - 3)$

30. $\log_3 (7x - 6) < \log_3 (4x + 9)$

31. $\log_5 (12x + 5) \leq \log_5 (8x + 9)$

32. $\log_{11} (3x - 24) \geq \log_{11} (-5x - 8)$

33. $\log_9 (9x + 4) \leq \log_9 (11x - 12)$

38. **CCSS CRITIQUE** Ryan and Heather are solving $\log_3 x \geq -3$. Is either of them correct? Explain your reasoning.

Ryan

$$\log_3 x \geq -3$$

$$x \geq 3^{-3}$$

$$x \geq \frac{1}{27}$$

Heather

$$\log_3 x \geq -3$$

$$x \geq 3^{-3}$$

$$0 < x \leq \frac{1}{27}$$