

pg. 441 # 2, 5-26, 28, 35, 36, 40, 49

2. Chile > MO
9.5 > 7.9

$$\frac{E \cdot 30^{9.5}}{E \cdot 30^{7.9}}$$

$$= 30^{9.5-7.9}$$

$$= 30^{1.6}$$

use a
calculator

Chile's was 230.9 times more
energy

6. $49 = 7^2$

$$\log_7 49 = 2$$

14. $\log_2 16 = \frac{\log 16}{\log 2} = 4$

26. $\text{pH} = -\log [\text{H}^+]$
 $5.2 = -\log [\text{H}^+]$
 $-5.2 = \log [\text{H}^+]$
 $10^{-5.2} = 10^{\log [\text{H}^+]}$
 6.3×10^{-6}

35. graph paper

49. $3.2 \times 10^{-4} = 10^x \leftarrow x = -\log [\text{H}^+]$

$$\log 3.2 \times 10^{-4} = \log_{10} x$$

$$\log 3.2 \times 10^{-4} = x$$

$$-3.5 = x$$

$$3.5 = -x$$

$$3.5 = -\log [\text{H}^+]$$

acidic $3.5 < 7$

$2.5 \times 10^{-5} = 10^x \leftarrow x = -\log [\text{H}^+]$

$$\log 2.5 \times 10^{-5} = x$$

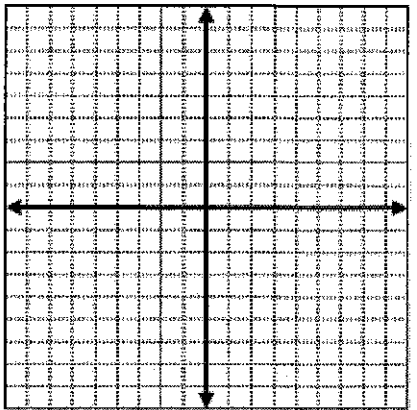
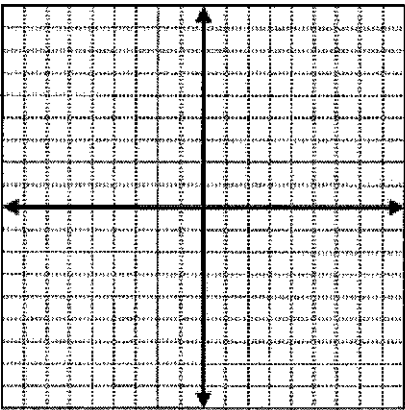
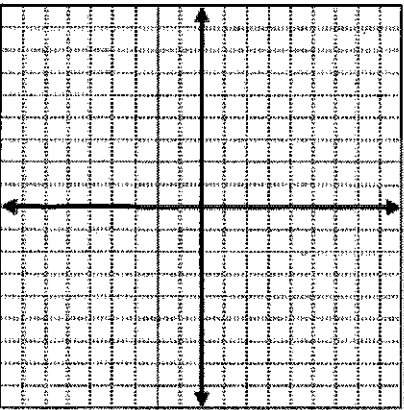
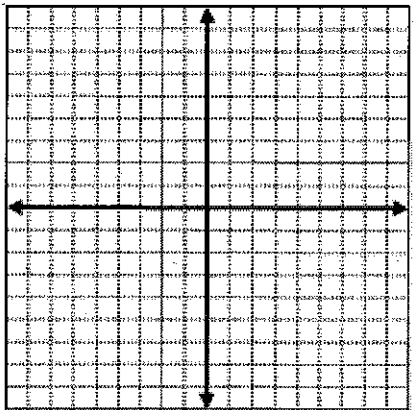
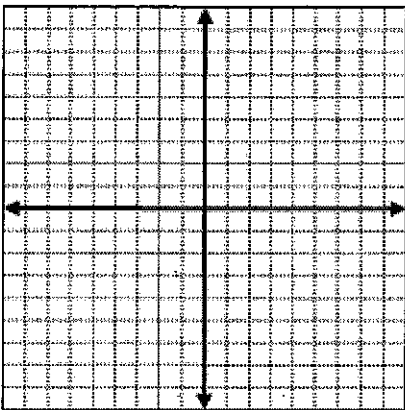
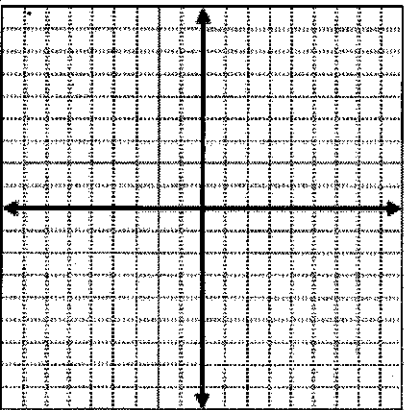
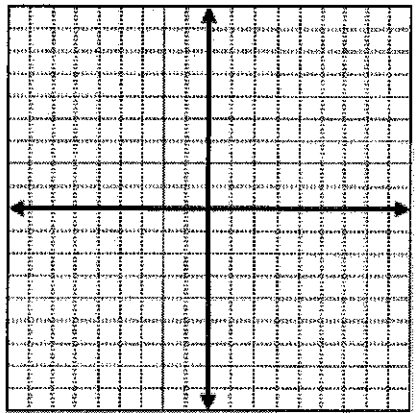
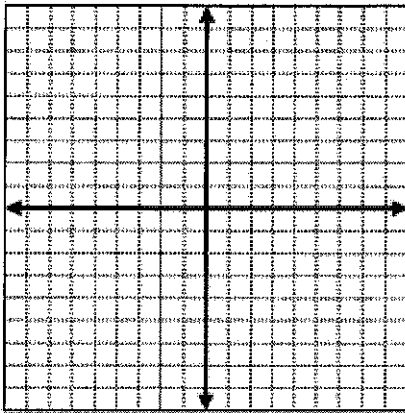
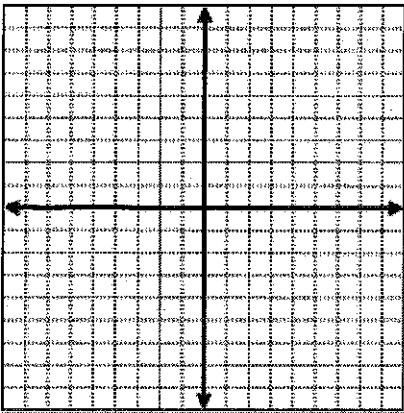
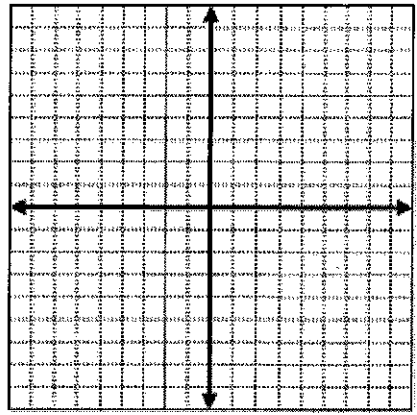
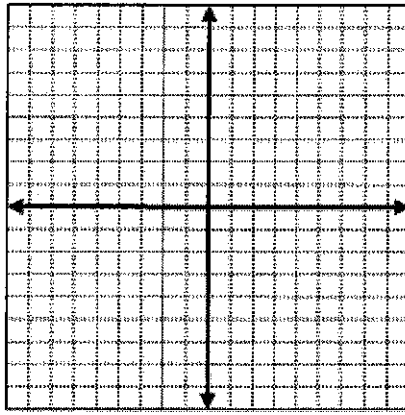
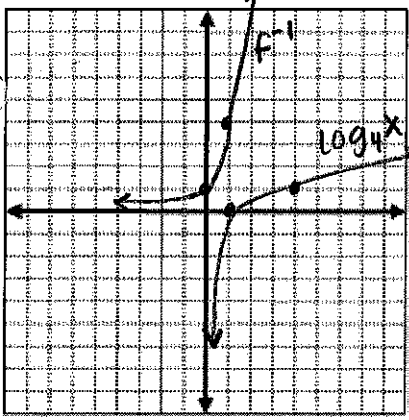
$$-4.6 = x$$

$$4.6 = -x$$

$$4.6 = -\log [\text{H}^+]$$

acidic $4.6 < 7$

35. $\log_4 x$ $f^{-1} = 4^x$



Answers for Lesson 8-3, pp. 441–444 Exercises

1. The earthquake in Missouri released about 1.97 times more energy.
2. The earthquake in Chile released about 231 times more energy.
3. The earthquake in Missouri released about 8,759,310 times more energy.
4. The earthquake in Missouri released about 30 times more energy.
5. The earthquake in Alaska released about 83 times more energy.

6. $\log_7 49 = 2$

7. $3 = \log 1000$

8. $\log_5 625 = 4$

9. $\log \frac{1}{10} = -1$

10. $2 = \log_8 64$

11. $\log_{\frac{1}{2}} 4 = -2$

12. $3 = \log_{\frac{1}{3}} \left(\frac{1}{27}\right)$

13. $-2 = \log 0.01$

14. 4

15. $\frac{1}{2}$

16. 1

17. $\frac{3}{2}$

18. 3

19. $\frac{1}{2}$

20. undefined

21. 2

22. 5

23. 1

24. 4

25. 3

26. 6.3×10^{-6}

27. 6.3×10^{-3}

28. 1.0×10^{-8}

29. 7.9×10^{-4}

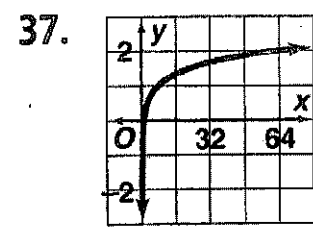
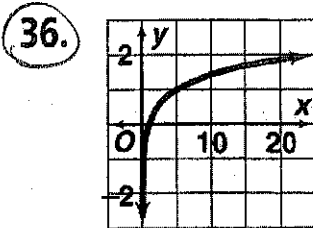
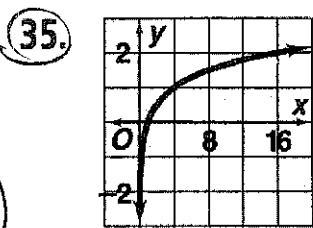
30. 5.0×10^{-7}

31. 1.3×10^{-5}

32. 1.0×10^{-4}

33. 4.0×10^{-6}

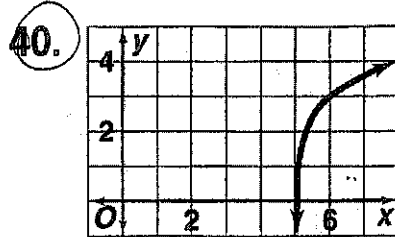
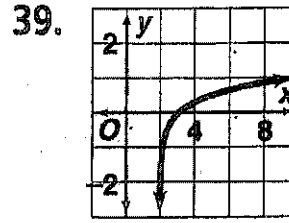
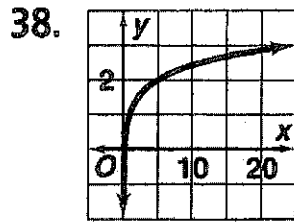
34. 2.5×10^{-4}



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26

Answers for Lesson 8-3, pp. 441–444 Exercises (cont.)



41. 0.6990; 0

42. -4.2147; -5

43. -1.0969; -2

44. 2.3010; 2

45. -0.7782; -1

46. 1.2435; 1

47. 7.1139; 7

48. 0.5119; 0

49. apple juice: 3.5, acidic; buttermilk: 4.6, acidic; cream: 6.6, acidic; ketchup: 3.9, acidic; shrimp sauce: 7.1, basic; strained peas: 6, acidic

50. The error is in the second line. It should read $3 = 27^x$; the correct answer is $\frac{1}{3}$.

51. First rewrite $y = \log_1 x$ as $1^y = x$. For any real number y , $x = 1$.

52. Answers may vary. Sample: $y = \log_3 x$; $y = 3^x$

