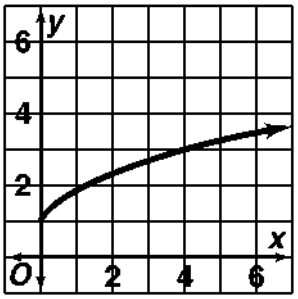
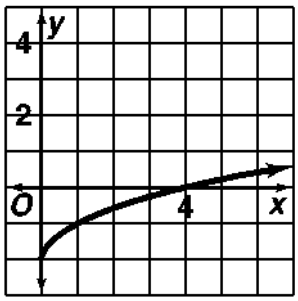
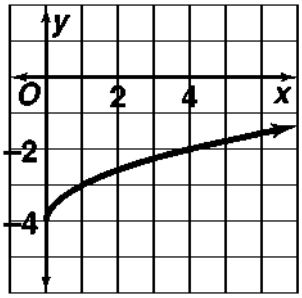
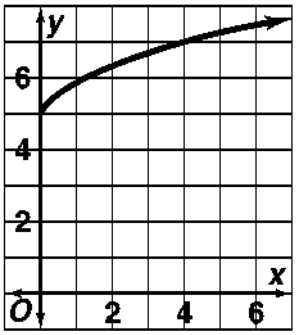
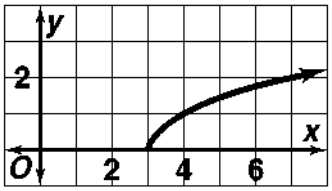
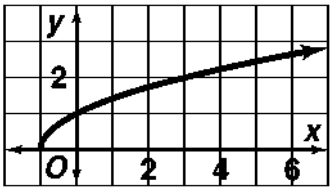
1. 

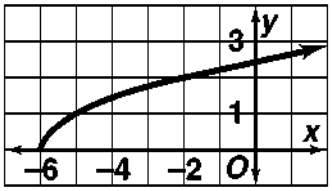
2. 

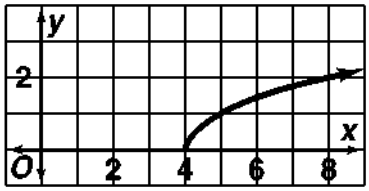
3. 

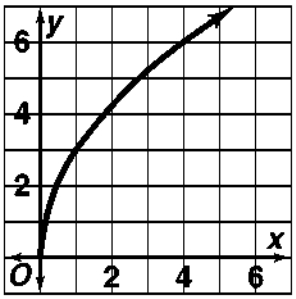
4. 

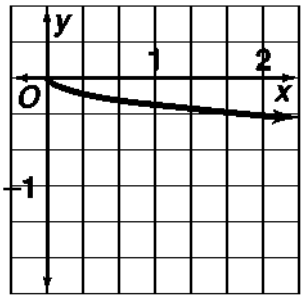
5. 

6. 

7. 

8. 

9. 

10. 

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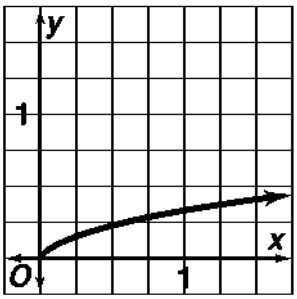

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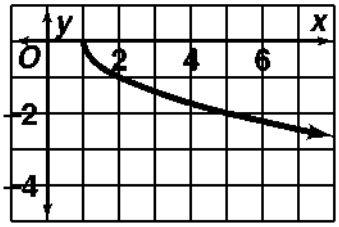

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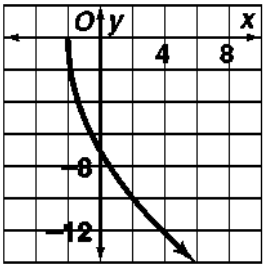

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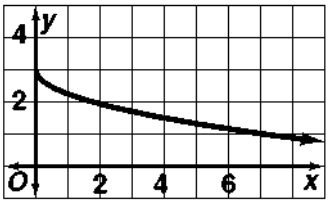

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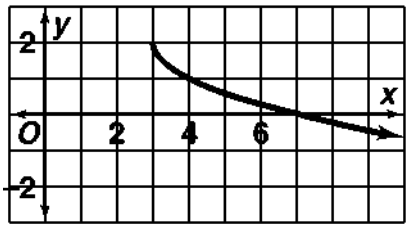

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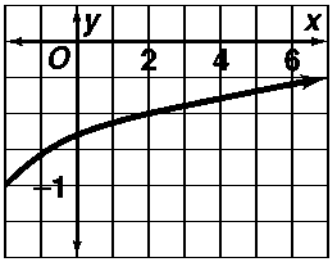

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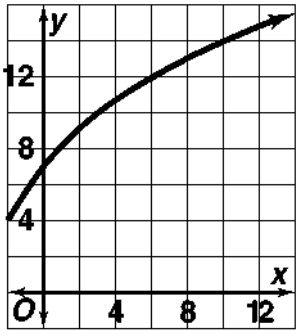

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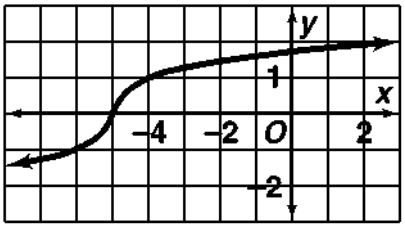

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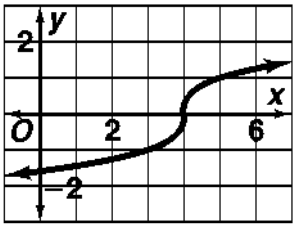

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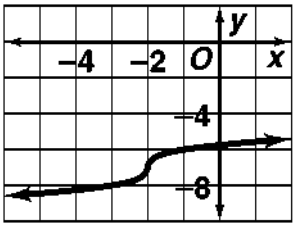
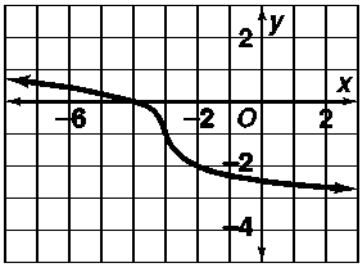
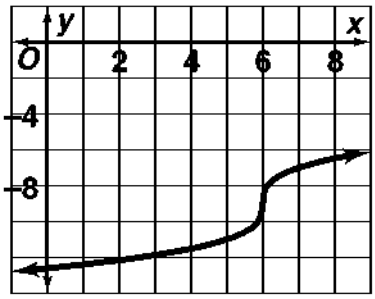
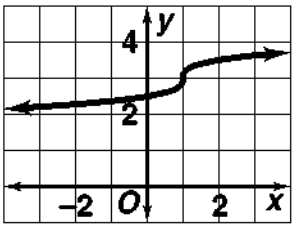
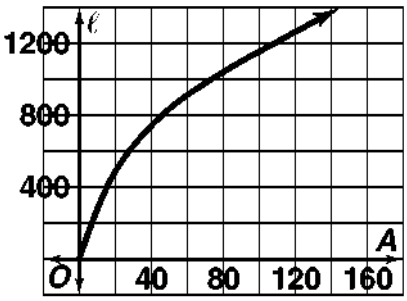


21. 

22. 

23. 

24. a. 

b. ≈745 ft, ≈1053 ft, ≈1343 ft

25. 147 **26.** 9.5 **27.** -8.11

28. no solution; the left-hand side is never negative, but the right is always negative.

29. 5 **30.** -1

31. $y = 3\sqrt{x - 1}$; the graph is the graph of $y = 3\sqrt{x}$ translated 1 unit to the right.

32. $y = -4\sqrt{x + 2}$; the graph is the graph of $y = -4\sqrt{x}$ translated 2 units to the left.

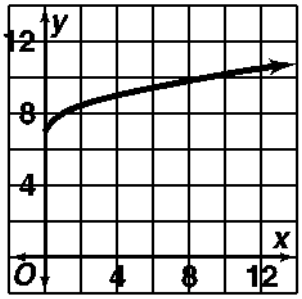
33. $y = -14\sqrt{x + 1}$; the graph is the graph of $y = -14\sqrt{x}$ translated 1 unit to the left.

34. $y = 4\sqrt[3]{x + 2}$; the graph is the graph of $y = 4\sqrt[3]{x}$ translated 2 units to the left.

35. $y = 8\sqrt{x - 2} - 3$; the graph is the graph of $y = 8\sqrt{x}$ translated 2 units to the right and 3 units down.

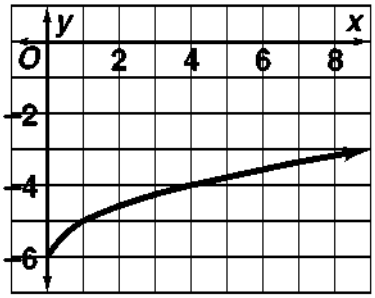
36. $y = 3\sqrt[3]{x - 2} + 1$; the graph is the graph of $y = 3\sqrt[3]{x}$ translated 2 units to the right and 1 unit up.

37.



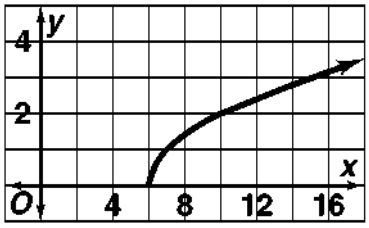
D:$x \geq 0$, R:$y \geq 7$

38.



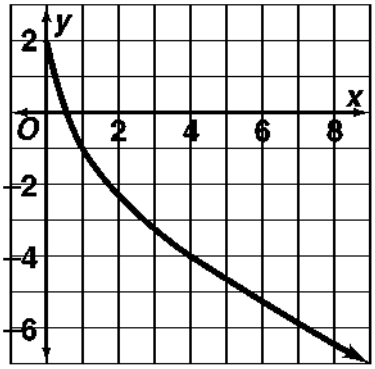
D:$x \geq 0$, R: $y \geq -6$

39.



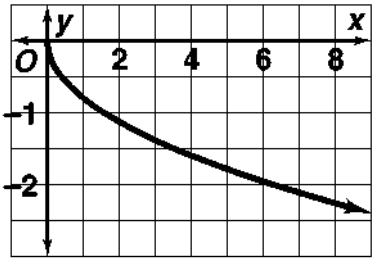
D:$x \geq 6$, R:$y \geq 0$

40.



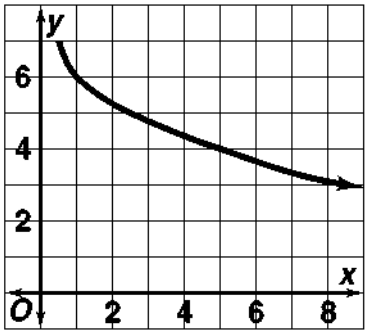
D: $x \geq 0$, R:$y \leq 2$

41.



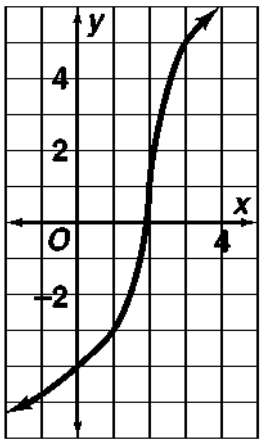
D:$x \geq 0$, R: $y \leq 0$

42.



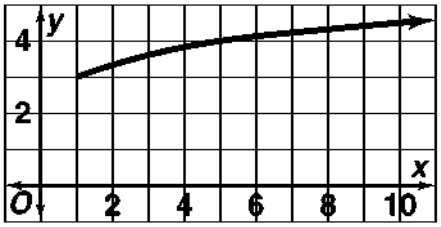
D: $x \geq \frac{1}{2}$, R: $y \leq 7$

43.

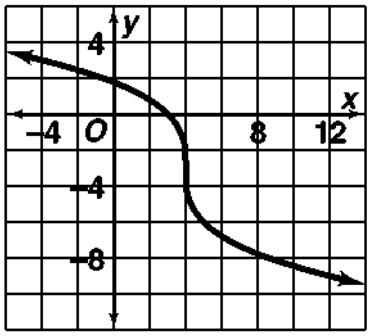


D: all real numbers,
R: all real numbers

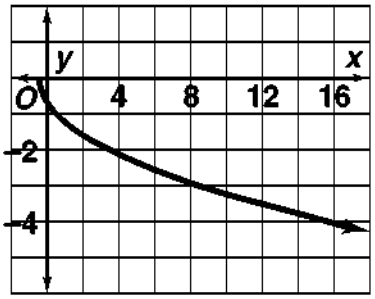
44.



D: $x \geq 1$, R:$y \geq 3$

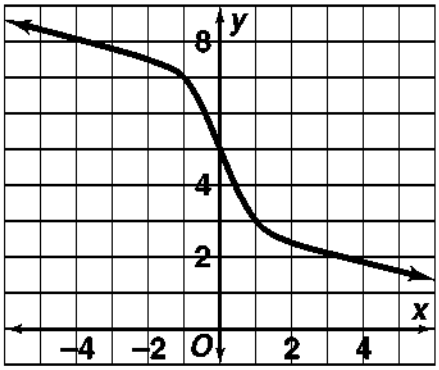


D: all real numbers,
R: all real numbers



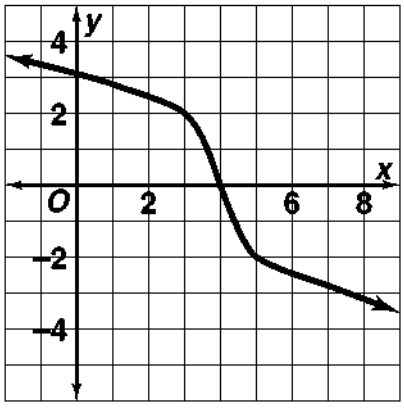
D: $x \geq -\frac{1}{2}$, R:$y \leq 0$

47.

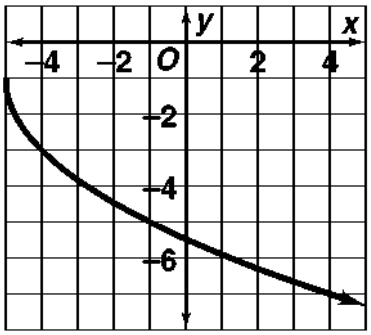


D: all real numbers,
R: all real numbers

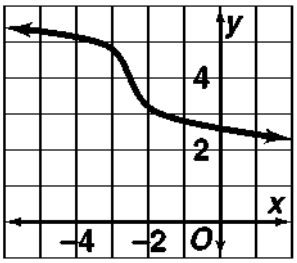
48.



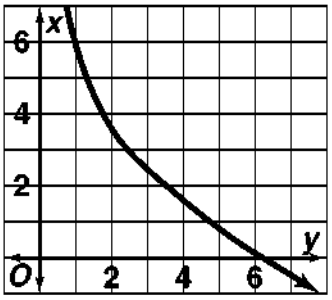
D: all real numbers,
R: all real numbers

49. 

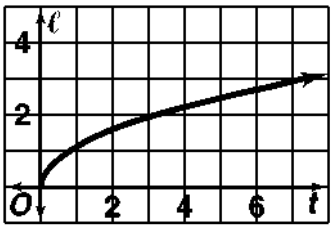
D:$x \geq -5$, R:$y \leq -1$

50. 

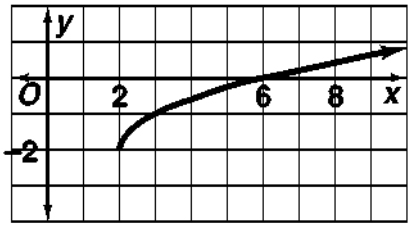
D: all real numbers,
R: all real numbers

51. 

D:$x \geq \frac{3}{4}$, R:$y \leq 7$

52. a. 

b. ≈4.3 s; ≈6.1 s

53. a. 

b. D: $x \geq 2$, R:$y \geq -2$

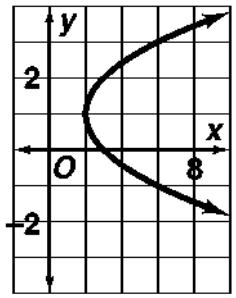
c. (2, -2)

d. The domain is based on the *x*-coordinate of that point, and the range is based on the *y*-coordinate.

54. a. $y = \sqrt{x - 5} - 2$

b. $y = \sqrt{x - 1} - 5$

55.a.



b. Both domains are $x \geq 2$. The range of $y = \sqrt{x - 2} + 1$ is $y \geq 1$. The range of $y = -\sqrt{x - 2} + 1$ is $y \leq 1$.

56. $y = 5\sqrt{x - 4} - 1$; the graph is the same as $y = 5\sqrt{x}$, translated 4 units to the right and 1 down.

57. $y = 6\sqrt{x + 3} + 4$; the graph is the graph of $y = 6\sqrt{x}$ translated 3 units to the left and 4 up.

58. $y = -2\sqrt[3]{x - \frac{1}{4}}$; the graph is the graph of $y = -2\sqrt[3]{x}$ translated $\frac{1}{4}$ unit to the right.

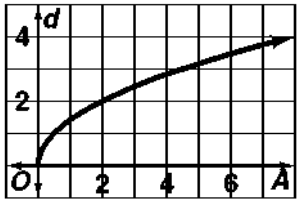
59. $y = \frac{1}{2}\sqrt{x - 1} - 2$; the graph is the same as $y = \frac{1}{2}\sqrt{x}$ translated 1 unit right and 2 down.

60. $y = 10 - \frac{1}{3}\sqrt[3]{x + 3}$; the graph is the same as $y = -\frac{1}{3}\sqrt[3]{x}$ translated 3 units to the left and 10 up.

61. $y = \frac{1}{3}\sqrt{x + 9} + 5$; the graph is the same as $y = \frac{1}{3}\sqrt{x}$, translated 9 units to the left and 5 up.

62. Answers may vary. Sample: $y = \sqrt[3]{x - 2} + 4$

63. a.



b. 20 in.

64. If $a > 0$, the graph is stretched vertically by a factor of a. If $a < 0$, the graph is reflected over the x-axis and stretched vertically by a factor of $|a|$.

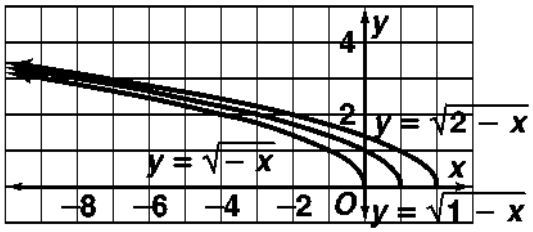
65. $y = -\sqrt{2}\sqrt{x + 4}$; the graph is the graph of $y = -\sqrt{2x}$ translated 4 units to the left; domain: $x \geq -4$, range: $y \leq 0$.

66. $y = -\sqrt{8}\sqrt{x - \frac{3}{4}}$; the graph is the graph of $y = -\sqrt{8x}$ translated $\frac{3}{4}$ units to the right; domain: $x \geq \frac{3}{4}$, range: $y \leq 0$.

67. $y = \sqrt{3} \cdot \sqrt{x - \frac{5}{3}} + 6$; the graph is the graph of $y = \sqrt{3x}$ translated $\frac{5}{3}$ units to the right and 6 units up; domain: $x \geq \frac{5}{3}$, range: $y \geq 6$.

68. $y = -\sqrt{12} \cdot \sqrt{x + \frac{3}{2}} - 3$; the graph is the graph of $y = -\sqrt{12x}$ translated $\frac{3}{2}$ units to the left and 3 units down; domain: $x \geq -\frac{3}{2}$, range: $y \leq -3$.

69. a.



b. The graph of $y = \sqrt{h - x}$ is a reflection of the graph of $y = \sqrt{x - h}$ in the line $x = h$.

70. for all odd positive integers