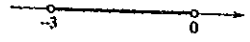
Some Solutions to Chapter 2

# Chapter 2

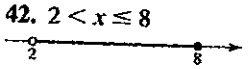
## Section 2.1 ■ page 10

1. (a) 50 (b) 0, −10, 50 (c) 0, −10, 50, $\frac{22}{7}$, 0.538, $1.2\overline{3}$, $-\frac{1}{3}$ (d) $\sqrt{7}$, $\sqrt[3]{2}$ 2. (a) 11, $\sqrt{16}$ (b) −11, 11, $\sqrt{16}$ (c) 1.001, $0.3\overline{3}$, −11, 11, $\frac{13}{15}$, $\sqrt{16}$, 3.14, $\frac{15}{3}$ (d) $-\pi$
3. Commutative Property for addition
4. Commutative Property for multiplication
5. Associative Property for addition
6. Distributive Property
7. Distributive Property
8. Distributive Property
9. Commutative Property for multiplication
10. Distributive Property 11. $3 + x$ 12. $(7 \cdot 3)x$
13. $4A + 4B$ 14. $5(x + y)$ 15. $3x + 3y$ 16. $8a - 8b$
17. $8m$ 18. $-8y$ 19. $-5x + 10y$
20. $3ab + 3ac - 6ad$ 21. (a) $\frac{17}{30}$ (b) $\frac{9}{20}$ 22. (a) $\frac{1}{15}$ (b) $\frac{35}{24}$
23. (a) 3 (b) $\frac{25}{72}$ 24. (a) $\frac{13}{20}$ (b) $\frac{5}{36}$
25. (a) $\frac{8}{3}$ (b) 6 26. (a) $\frac{15}{2}$ (b) 3 27. (a) < (b) >
(c) = 28. (a) < (b) > (c) = 29. (a) False (b) True
30. (a) True (b) False 31. (a) False (b) True
32. (a) False (b) True 33. (a) $x > 0$ (b) $t < 4$
(c) $a \geq \pi$ (d) $-5 < x < \frac{1}{3}$ (e) $|p - 3| \leq 5$
34. (a) $y < 0$ (b) $z > 1$ (c) $b \leq 8$ (d) $0 < w \leq 17$
(e) $|y - \pi| \geq 2$ 35. (a) {1, 2, 3, 4, 5, 6, 7, 8}
(b) {2, 4, 6} 36. (a) {2, 4, 6, 7, 8, 9, 10} (b) {8}
37. (a) {1, 2, 3, 4, 5, 6, 7, 8, 9, 10} (b) {7}
38. (a) {1, 2, 3, 4, 5, 6, 7, 8, 9, 10} (b) ∅
39. (a) $\{x \mid x \leq 5\}$ (b) $\{x \mid -1 < x < 4\}$
40. (a) $\{x \mid -1 < x \leq 5\}$ (b) $\{x \mid -2 \leq x < 4\}$

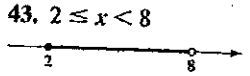
41. $-3 < x < 0$



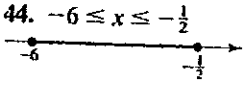

42. $2 < x \leq 8$



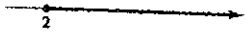

43. $2 \leq x < 8$



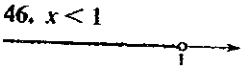

44. $-6 \leq x \leq -\frac{1}{2}$



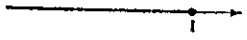

45. $x \geq 2$



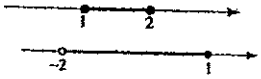

46. $x < 1$



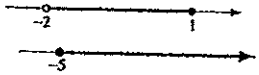

47. $(-\infty, 1]$



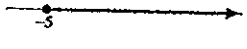

48. $[1, 2]$



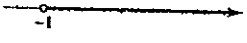

49. $(-2, 1]$



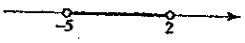

50. $[-5, \infty)$




51. $(-1, \infty)$



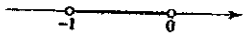

52. $(-5, 2)$



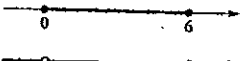

53. (a) $[-3, 5]$ (b) $(-3, 5]$ 54. (a) $[0, 2)$ (b) $(-2, 0]$

55.

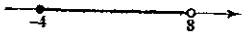

56.



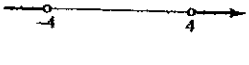

57.



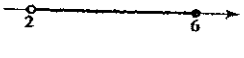

58.




59.



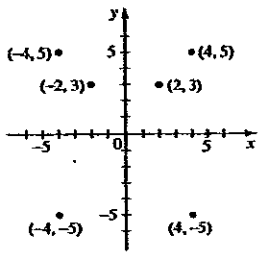

60.



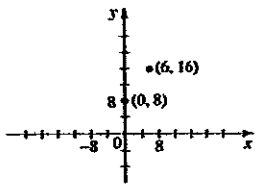

61. (a) 100 (b) 73 62. (a) $5 - \sqrt{5}$ (b) $10 - \pi$
63. (a) 2 (b) −1 64. (a) 10 (b) −1 65. (a) 12
(b) 5 66. (a) $\frac{1}{4}$ (b) 1 67. 5 68. 4 69. (a) 15 (b) 24
(c) $\frac{67}{40}$ 70. (a) $\frac{18}{35}$ (b) 19 (c) 0.8 71. (a) $\frac{7}{9}$ (b) $\frac{13}{45}$
(c) $\frac{19}{33}$ 72. (a) $\frac{518}{99}$ (b) $\frac{62}{45}$ (c) $\frac{1057}{495}$
73. Distributive Property
74. $T_O - T_G$: −9, −3, 0, 5, 8, 1, −1
$|T_O - T_G|$: 9, 3, 0, 5, 8, 1, 1
$T_O - T_G$ gives more information because it tells us which city had the higher (or lower) temperature.
75. (a) Yes, no (b) 6 ft

## Section 2.2 ■ page 97

1.

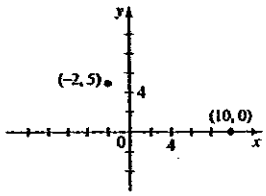



2. $A(5, 1)$, $B(1, 2)$, $C(-2, 6)$, $D(-6, 2)$, $E(-4, -1)$, $F(-2, 0)$, $G(-1, -3)$, $H(2, -2)$ 3. (a) $\sqrt{13}$ (b) $\left(\frac{3}{2}, 1\right)$ 4. (a) 5
(b) $\left(0, \frac{1}{2}\right)$ 5. (a) 10 (b) (1, 0) 6. (a) $2\sqrt{10}$ (b) (1, −2)
7. (a)



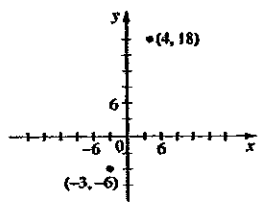

(b) 10 (c) (3, 12)

8. (a)



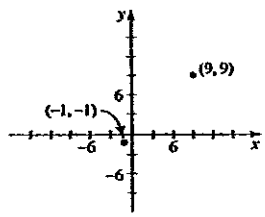

(b) 13 (c) $\left(4, \frac{5}{2}\right)$

9. (a)




(b) 25 (c) $\left(\frac{1}{2}, 6\right)$

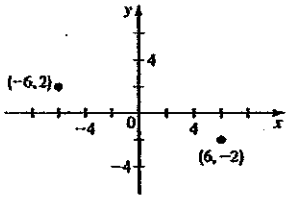
10. (a)




(b) $10\sqrt{2}$ (c) (4, 4)

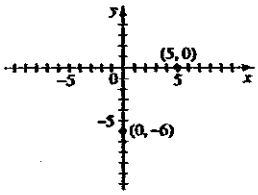
# More Solutions to 2.8

**11.** (a)



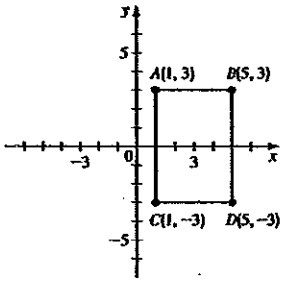

(b) $4\sqrt{10}$ (c) (0, 0)

**12.** (a)

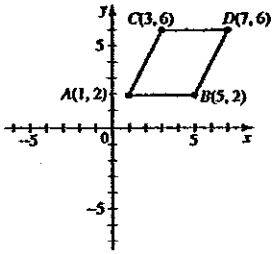



(b) $\sqrt{61}$ (c) $\left(\frac{5}{2}, -3\right)$

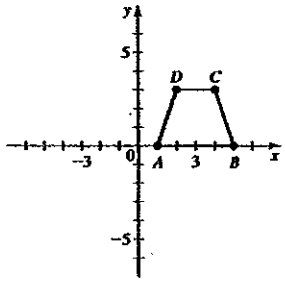
**13.** 24



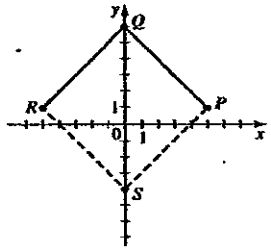

**14.** 16



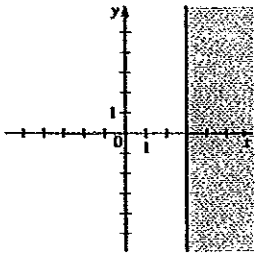

**15.** Trapezoid, area = 9



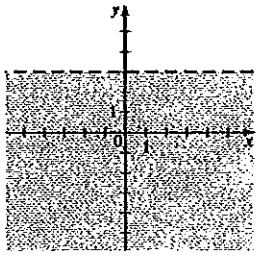

**16.** 50



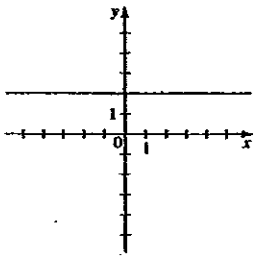

**17.**



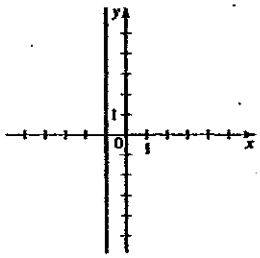

**18.**



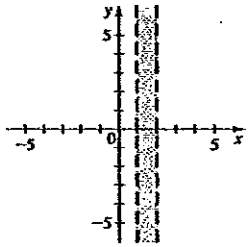

**19.**



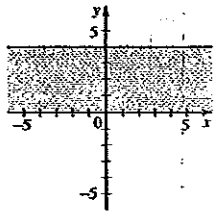

**20.**



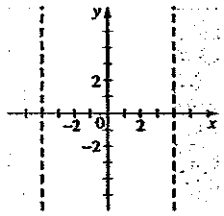

**21.**



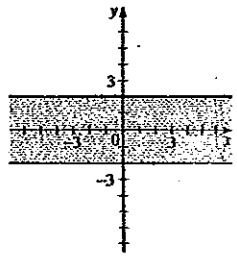

**22.**



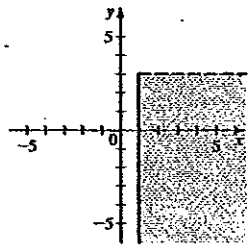

**23.**



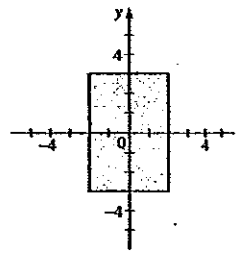

**24.**




**25.**



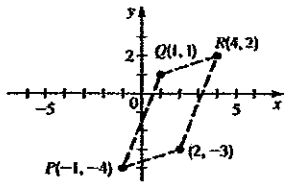

**26.**




**27.** $A(6, 7)$ **28.** $C(-6, 3)$ **29.** $Q(-1, 3)$ **32.** 9

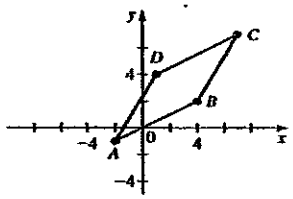
**33.** (b) 10 **37.** $(0, -4)$ **38.** $\sqrt{37}, \frac{\sqrt{109}}{2}, \frac{\sqrt{145}}{2}$

**39.** $(2, -3)$




**40.** (10, 13)

**41.** (a)

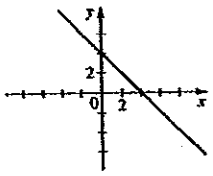



(b) $\left(\frac{5}{2}, 3\right), \left(\frac{5}{2}, 3\right)$

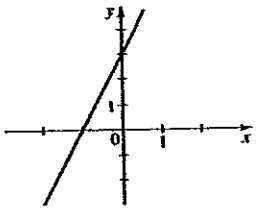
**43.** No, yes, yes **44.** No, yes, yes **45.** Yes, no, yes
**46.** Yes, yes, yes **47.** $x$-intercepts 0, 4; $y$-intercept 0
**48.** $x$-intercepts $-3$, 3; $y$-intercepts $-2$, 2
**49.** $x$-intercepts $-2$, 2; $y$-intercepts $-4$, 4
**50.** $x$-intercepts $-8$, 8; $y$-intercept 4

# More Solutions to 2.8

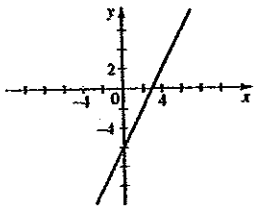
**51.** $x$-intercept 4,
$y$-intercept 4,
no symmetry



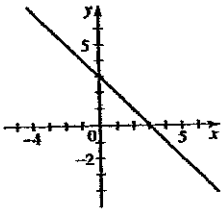
**52.** $x$-intercept $-1$,
$y$-intercept 3,
no symmetry



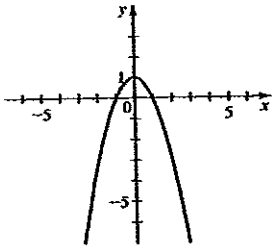
**53.** $x$-intercept 3,
$y$-intercept $-6$,
no symmetry



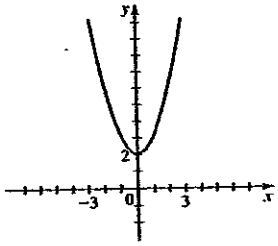
**54.** $x$-intercept 3,
$y$-intercept 3,
no symmetry



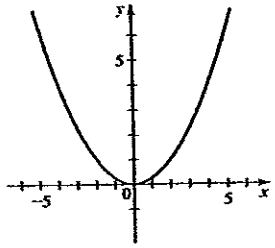
**55.** $x$-intercepts $\pm 1$,
$y$-intercept 1,
symmetry about $y$-axis



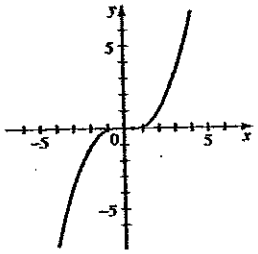
**56.** No $x$-intercepts,
$y$-intercept 2,
symmetry about $y$-axis



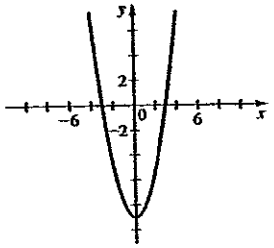
**57.** $x$-intercept 0,
$y$-intercept 0,
symmetry about $y$-axis



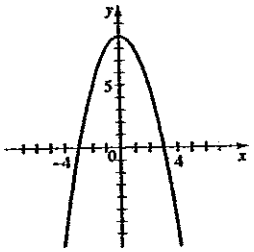
**58.** $x$-intercept 0,
$y$-intercept 0,
symmetry about origin



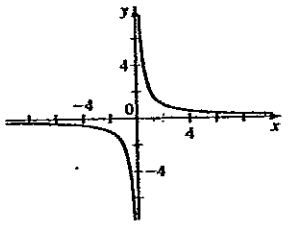
**59.** $x$-intercepts $\pm 3$,
$y$-intercept $-9$,
symmetry about $y$-axis



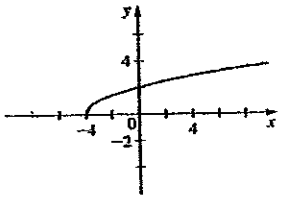
**60.** $x$-intercepts $-3$, 3,
$y$-intercept 9,
symmetry about $y$-axis



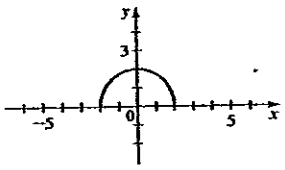
**61.** No intercepts,
symmetry about origin



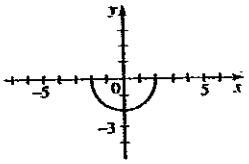
**62.** $x$-intercept $-4$,
$y$-intercept 2,
no symmetry



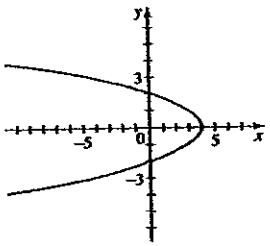
**63.** $x$-intercepts $\pm 2$,
$y$-intercept 2,
symmetry about $y$-axis



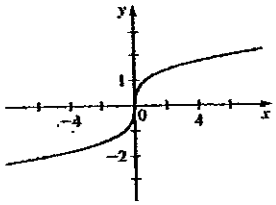
**64.** $x$-intercepts $-2$, 2,
$y$-intercept $-2$,
symmetry about $y$-axis



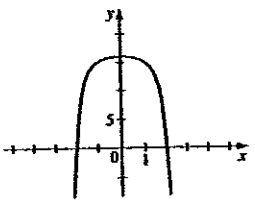
**65.** $x$-intercept 4,
$y$-intercepts $-2$, 2,
symmetry about $x$-axis



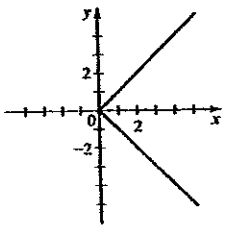
**66.** $x$-intercept 0,
$y$-intercept 0,
symmetry about origin



**67.** $x$-intercepts $\pm 2$,
$y$-intercept 16,
symmetry about $y$-axis

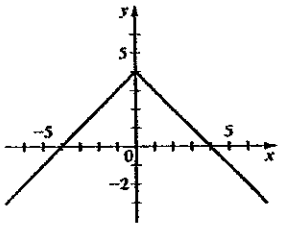


**68.** $x$-intercept 0,
$y$-intercept 0,
symmetry about $x$-axis

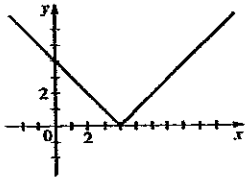


# More solutions to 2.8

**69.** $x$-intercepts $\pm 4$, $y$-intercept 4, symmetry about $y$-axis




**70.** $x$-intercept 4, $y$-intercept 4, no symmetry




**71.** Symmetry about $y$-axis

**72.** Symmetry about $x$-axis

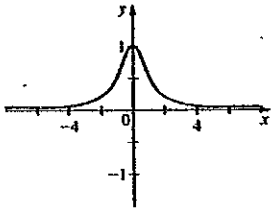
**73.** Symmetry about origin

**74.** Symmetry about $x$-axis, $y$-axis, and origin

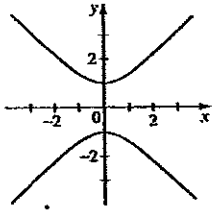
**75.** Symmetry about origin

**76.** Symmetry about $y$-axis

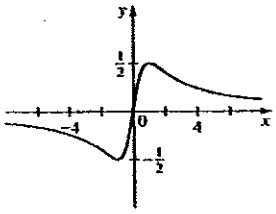
**77.**



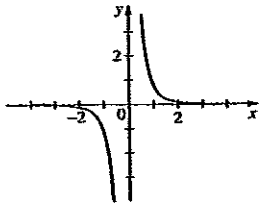

**78.**




**79.**




**80.**




**81.** $(x-2)^2+(y+1)^2=9$

**82.** $(x+1)^2+(y+4)^2=64$

**83.** $x^2+y^2=65$

**84.** $(x-2)^2+(y-5)^2=25$

**85.** $(x-7)^2+(y+3)^2=9$

**86.** $(x-5)^2+(y-5)^2=25$

**87.** $(x+2)^2+(y-2)^2=4$

**88.** $(x+1)^2+(y-1)^2=10$

**89.** $(2,-5),4$

**90.** $(0,-3),\sqrt{7}$

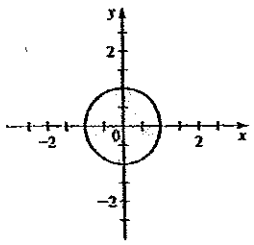
**91.** $\left(\frac{1}{4},-\frac{1}{4}\right),\frac{1}{2}$

**92.** $\left(-\frac{1}{4},-1\right),1$

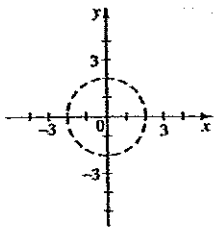
**93.** $\left(\frac{3}{4},0\right),\frac{3}{4}$

**94.** $\left(-1,\frac{1}{6}\right),\sqrt{37}/6$

**95.**

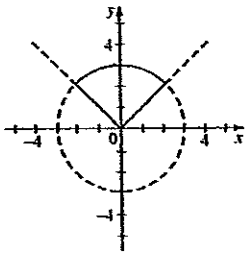



**96.**




**97.** $12\pi$

**98.** $\frac{9\pi}{4}$




**99.** (a) 5 (b) 31; 25 (c) Points $P$ and $Q$ must either be on the same street or the same avenue. **100.** (a) 15th Street and 12th Avenue (b) 17 blocks **101.** (a) 2 Mm, 8 Mm (b) −1.33, 7.33; 2.40 Mm, 7.60 Mm