



Selected Answers

Chapter 5

5.1 Skill Practice 1. open, left of -8


3. $s \leq 60$ 

5. $h > 48$ 

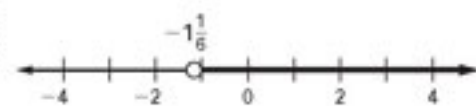
7. $x < 10$ 9. $x \geq -2$


11. $y \geq -16$ 


13. $n \leq -\frac{1}{5}$ 

15. $w > -17.6$ 

17. $s \geq 9$ 

19. $q > -1\frac{1}{6}$ 

21. $d > -6.84$ 

23. The number line should be shaded to the right of -3 , not the left. 

25. $n - 15 \leq 37; n \leq 52$ 

27. $x < 21.6$ 29. No; no; there are infinitely many solutions of an inequality, so it is not possible to check them all. One solution might check in the inequality while another does not. For example, if you incorrectly solve $x + 7 > 10$ as $x > 2$, the solution $x = 4$ checks in the original inequality.

5.1 Problem Solving 31. more than 8350 points

33. a. $s > 127.53$ b. Yes; no; no; $128.13 > 127.53$; $126.78 < 127.53$; when your score is 127.53, you and your competitor will tie. 35. *Sample answer:* You want to improve on your personal best of 16 points scored in a basketball game. In the first three quarters of the game, you scored 14 points. Write and solve an inequality to find the possible numbers of points that you can score in the fourth quarter to give yourself a new personal best; $x \geq 3$, if you score at least 3 points in the fourth quarter, you will have a new personal best.


37. a.


Original price, x (\$)	19,459	19,989	20,549	22,679	23,999
Final price, y (\$)	16,459	16,989	17,549	19,679	20,999


b. $x - 3000 \leq 17,000, x \leq 20,000$

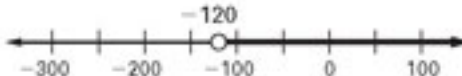
5.2 Skill Practice

1. Division property of inequality

3. $p \geq 7$ 

5. $y > 6$ 

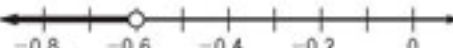
7. $q < 28$ 

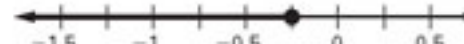
9. $g > -120$ 

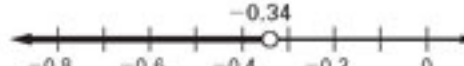
11. $t \leq -22.5$ 


13. $s \leq -5$ 

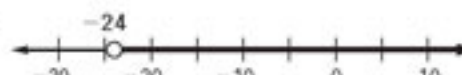
15. $f < -0.25$ 

17. $c < -0.6$ 

19. $z \leq -0.25$ 

21. $j < -0.34$ 

23. $r > -54$ 

25. $m > -24$ 

27. In both cases, you divide both sides of the inequality by a ; when $a > 0$, you do not reverse the inequality symbol, but when $a < 0$, you do. 29. Both sides of the inequality were multiplied by a positive number, so the inequality symbol should not have been reversed; $x \leq -63$.

31. $-15y \leq 90; y \geq -6$ 

33. $\frac{w}{24} \geq -\frac{1}{6}; w \geq -4$ 

5.2 Problem Solving 37. at least 200 words

39. at least 3.2 41. a. $400h \leq 6560, h \leq 16.4$, no more than 16 horses b. No; the area added by increasing both the length and the width by 20 feet can be divided into 2 rectangles (80 feet by 20 feet and 82 feet by 20 feet) and 1 square (20 feet by 20 feet). The 400 square feet of the square is large enough to hold one horse, and the rectangular areas will be able to hold additional horses. c. no more than 23 horses; the area of the new corral is $(80 + 15)(82 + 15) = 9215$ square feet. Find the possible numbers of horses h the corral can hold by solving the inequality $9215 \geq 400h; h \leq 23.04$.

Selected Answers

5.3 Skill Practice

1. equivalent inequalities

3. $x > 5$

5. $v \geq -1$

7. $r \geq 1\frac{1}{7}$

9. $m > 3$

11. $p < \frac{1}{2}$

13. $d > -10$

15. The inequality symbol was not reversed when dividing both sides by -3 ; $x \leq -13$. 17. all real numbers 19. $s \geq 0$ 21. all real numbers 23. no solution 25. no solution 27. no solution

29. $3x + 4 < 40$; $x < 12$

31. $5x + 2x > 9x - 4$; $x < 2$

35. $\frac{1}{2} \cdot 8(x + 1) \leq 44$; $x \leq 10$

5.3 Problem Solving 37. at most 11 songs

39. a. Up to 6 swans; the area of the habitat is (20 feet)(50 feet) = 1000 square feet. 500 square feet are needed for the first two swans and the remaining $1000 - 500 = 500$ square feet can hold up to $500 \div 125 = 4$ more swans; so, the maximum number of swans is $2 + 4 = 6$ swans. b. at most 14 more swans

41. a.

Pitches per inning, p	15	16	17	18	19
Total number of pitches, t	98	101	104	107	110

b. $53 + 3p \leq 105$, $p \leq 17\frac{1}{3}$, at most 17 pitches

5.3 Problem Solving Workshop 1. at least 9 batches 3. at most 6 games 5. less than 7.9 min/mi

Extension 1. $x > 3$ 3. $x < 213.75$

5.4 Skill Practice

1. compound inequality

3. $2 < x < 6$

5. $-1.5 \leq x < 9.2$

7. $40 \leq s \leq 60$

9. $1 < x \leq 6$

11. $-4 \leq m \leq \frac{1}{4}$

13. $-\frac{1}{3} \leq p < 2$

15. $r < 2$ or $r \geq 7$

17. $v < -5$ or $v > 5$

19. $g < -2\frac{1}{3}$ or $g > 10$

21. 3 was subtracted from only two of the three expressions of the inequality; $1 < -2x < 6$, $-\frac{1}{2} > x > -3$.

23. $x + 5 < 8$ or $x - 3 > 5$; $x < 3$ or $x > 8$

25. $-8 \leq 3(x - 4) \leq 10$; $1\frac{1}{3} \leq x \leq 7\frac{1}{3}$

29. true 31. False. *Sample answer:* $a = -4$ is a solution of $x > 5$ or $x \leq -4$, but it is not a solution of $x > 5$.

5.4 Problem Solving

37. $-2600 \leq e \leq -100$

41. $3.2 \text{ lb} \leq f \leq 6.4 \text{ lb}$ 43. a. $\frac{5}{9}(F - 32) < 0$ or

$\frac{5}{9}(F - 32) > 100$, $F < 32^\circ\text{F}$ or $F > 212^\circ\text{F}$

b. 23°F , 239°F

$^\circ\text{F}$	23	86	140	194	239
$^\circ\text{C}$	-5	30	60	90	115

45. a. $8 \leq \frac{w}{300} \leq 10$, $2400 \leq w \leq 3000$; 2400 watts to 3000 watts b. Yes; no; the amplification per person for 350 people is $\frac{2900}{350} \approx 8.3$ watts, which is between 8 watts and 10 watts, the amplification per person for 400 people is $\frac{2900}{400} = 7.25$ watts, which is not between 8 watts and 10 watts. c. 4800 watts; because each person requires at least 8 watts of amplification, and you want to be sure to provide enough amplification for 600 people, you need at least $8(600) = 4800$ watts of amplification.

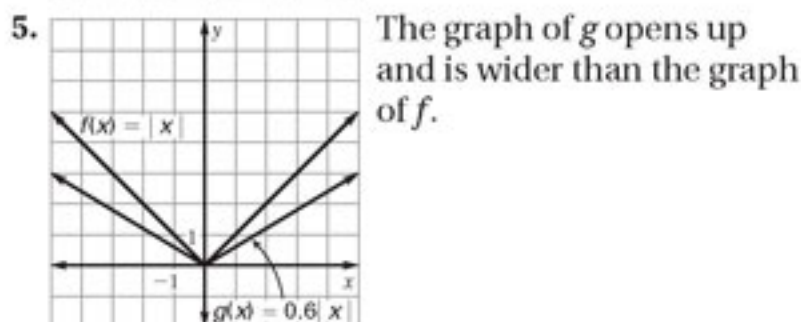
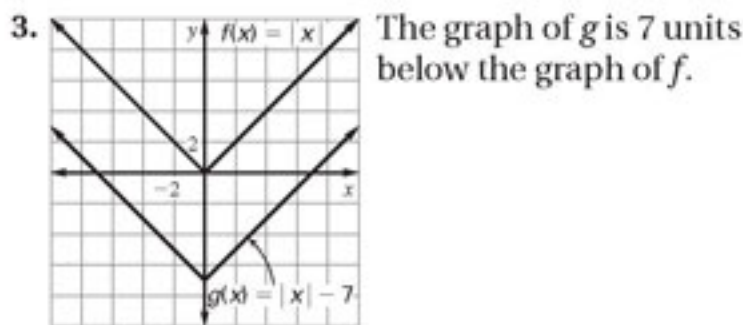
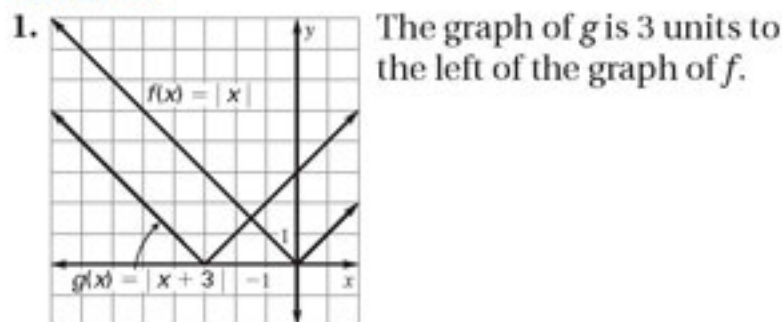
Selected Answers

- 5.4 Graphing Calculator Activity** 1. $4 < x < 7$; the graphs are the same. 3–7. Displays should show the graphs of the following inequalities. 3. $3 \leq x \leq 7$
5. $8 \leq x \leq 48$ 7. $x \leq 4\frac{1}{2}$ or $x \geq 5$

- 5.5 Skill Practice** 1. absolute value equation 3. 5, -5 5. 0.7, -0.7 7. $\frac{1}{2}$, $-\frac{1}{2}$ 9. 4, -10
11. -1, $-3\frac{2}{3}$ 13. 2, -9 15. 4, 9 17. $8\frac{1}{2}$, $-3\frac{1}{2}$
19. $-\frac{1}{2}$, $-2\frac{1}{2}$ 21. The absolute value symbol was removed without writing the second equation, $x + 4 = -13$; $x = 9$ or $x = -17$. 23. no solution 25. -4.5, -5.5
27. -3, 6 29. $13\frac{1}{2}$, $14\frac{1}{2}$ 31. $\frac{1}{4}$, $-1\frac{1}{4}$ 33. 13, -3
35. -7.5, -10.7 37. The distance between x and 3 is 7, 10, -4; $x - 3 = 7$ or $x - 3 = -7$, 10, -4; the solutions are the same. 39. $5|2x + 9| = 15$; -3, -6

- 5.5 Problem Solving** 43. 235 sec, 245 sec
45. a. 52.462 points, 56.888 points b. 0.3 point
47. a. $p = |s - 450|$ b. 300 points, 600 points
49. a. June 2005; November 2005 b. Yes; make a table of values for (m, p) using integer values of m from 0 to 8. Look for the lowest value of p in the table.

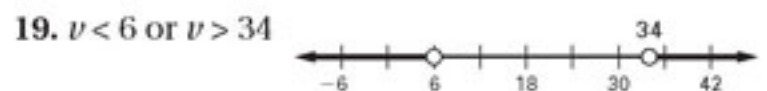
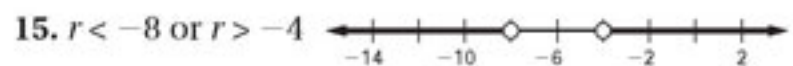
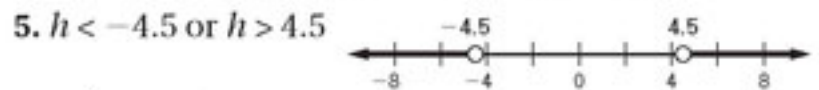
Extension



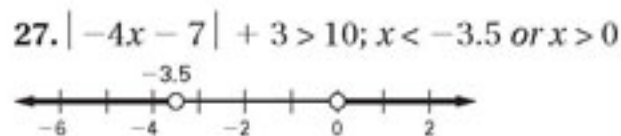
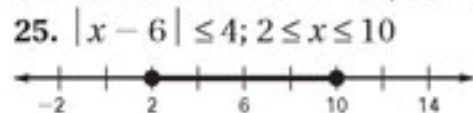
7. domain: all real numbers, range: $y \leq 1$; (0, 1); maximum value: 1

5.6 Skill Practice

1. equivalent inequalities



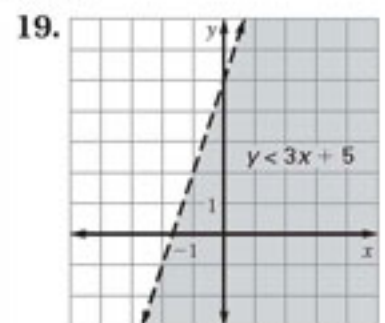
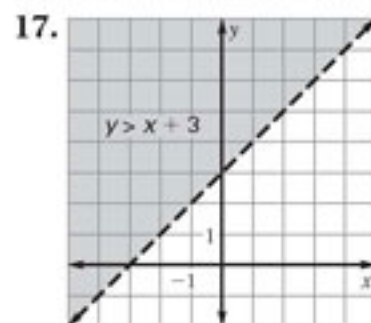
23. The compound inequality should use *or*: $x + 4 > 13$ or $x + 4 < -13$; $x > 9$ or $x < -17$.



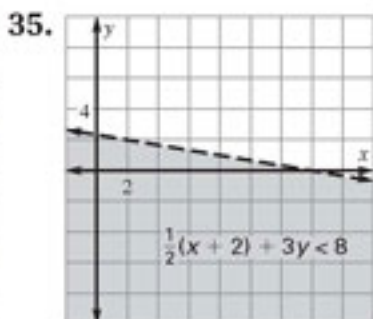
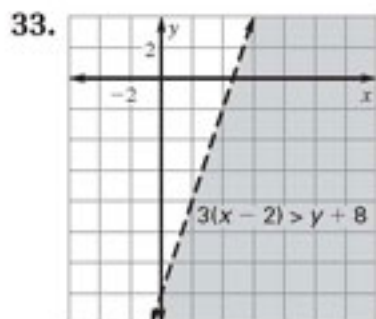
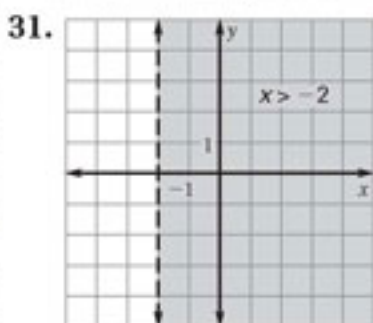
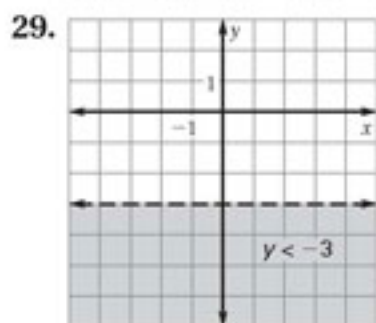
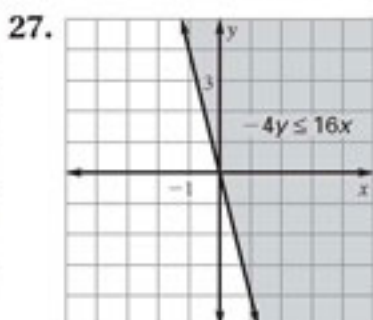
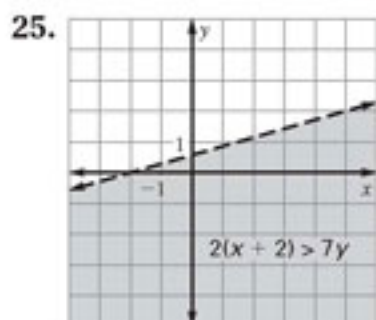
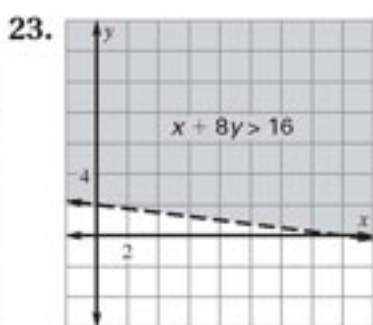
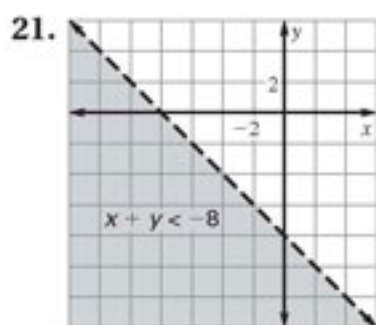
29. true 31. False. *Sample answer:* 20

- 5.6 Problem Solving** 35. at least 470 words and at most 530 words 37. $|t - 346| \leq 2$, at least 344°F and at most 348°F ; continue to preheat; the temperature is still below 350°F . 39. a. 10.02 m/sec^2 b. 0.88 m/sec^2

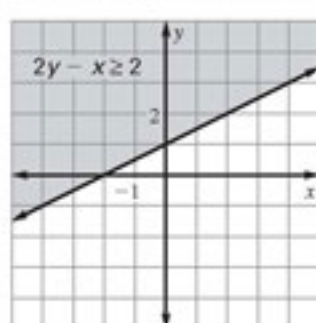
- 5.7 Skill Practice** 1. solution 3. not a solution 5. not a solution 7. not a solution 9. solution 11. not a solution 13. solution



Selected Answers



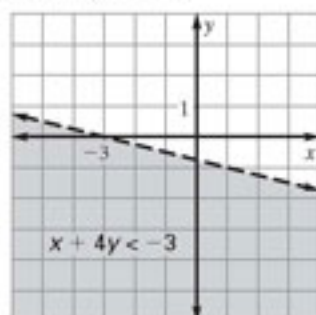
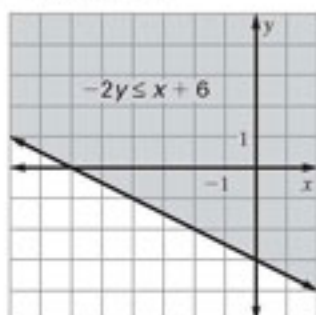
37. The wrong half-plane is shaded.



39. No; (0, 0) is a point on the boundary line $2x = -5y$.

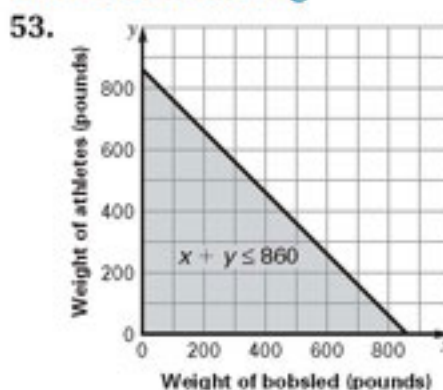
41. $-2y \leq x + 6$

43. $x + 4y < -3$



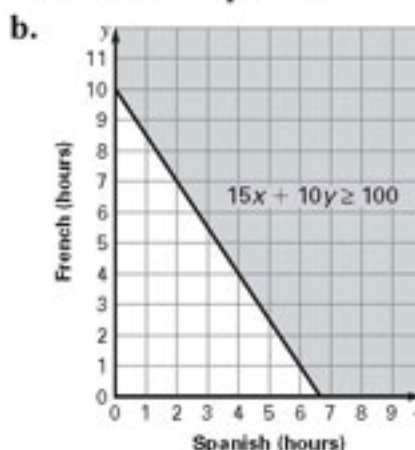
45. $y \leq \frac{5}{7}x - \frac{9}{7}$ 47. $y > 0$ 49. $y < 0$

5.7 Problem Solving



Sample answer: The solution (450, 400) means that the bobsled can weigh 450 pounds when the combined weight of the athletes is 400 pounds.

55. a. $15x + 10y \geq 100$



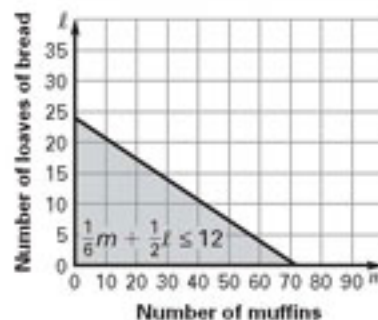
Sample answer: (4, 8), (5, 3), (6, 1)

c. *Sample answer:*

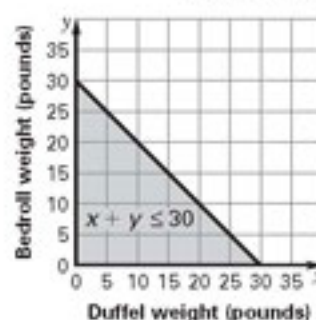
Spanish time (hours)	4	5	6
French time (hours)	8	3	1
Total earnings (dollars)	140	105	100

57. a. $\frac{1}{6}m + \frac{1}{2}\ell \leq 12$

b. $m \leq 60$



59. a. $x + y \leq 30$



Sample answer: (20, 4), (25, 5), (26, 2)

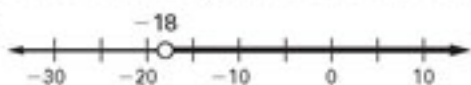
b. Yes; no; (0, 30) means that you do not take a duffel and have a 30 pound bedroll, while (30, 0) means you take a 30 pound duffel and do not take a bedroll. You need to bring both a duffel and a bedroll.

Chapter Review 1. $|x - 19| = 8$ 3. The boundary line is solid if the inequality symbol is \leq or \geq , the boundary line is dashed if the inequality symbol is $<$ or $>$; choose a test point that is not on the

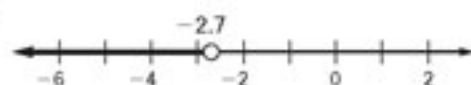
Selected Answers

boundary line. If the ordered pair is a solution to the inequality, shade the half-plane that contains the test point; if it not a solution, shade the other half-plane.

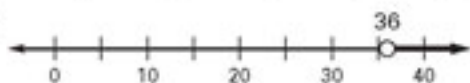
5. $x > -18$



7. $s < -2.7$



9. $n > 36$



11. $y \geq 9$



13. $g < 7$



15. $x \geq 3$



17. no solution



19. at most 5 tickets

21. $-1 < x < 3\frac{2}{3}$

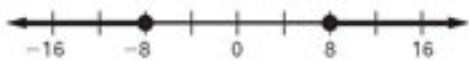


23. $w \leq \frac{1}{2}$ or $w > 2$



25. -4, -8 27. 5, 1 29. $1\frac{1}{6}, \frac{1}{6}$

31. $m \leq -8$ or $m \geq 8$



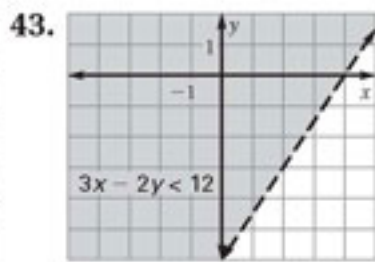
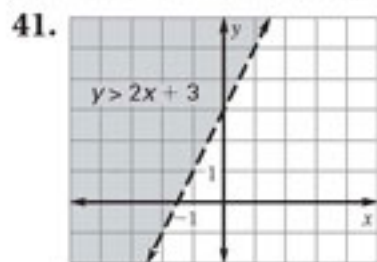
33. $-1 < g < 2\frac{1}{3}$



35. $j < -1\frac{1}{2}$ or $j > 10\frac{1}{2}$



37. solution 39. solution



Chapter 5 Extra Practice

1. $y > 5$



3. $x \leq 7$



5. $n \leq 2\frac{1}{2}$



7. $z < -4\frac{7}{8}$



9. $t \geq 1.5$



11. $y < -5.5$



13. $p \leq 9$



15. $x \geq 6$



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



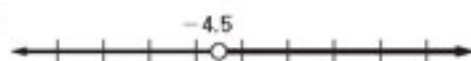
19. $z \leq 8$



21. $z \leq \frac{2}{3}$



23. $y > -4.5$



25. $x \geq 5$



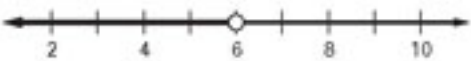
27. $t > -5$



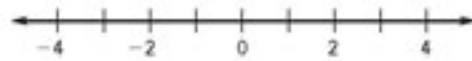
29. all real numbers



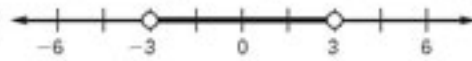
31. $y < 6$



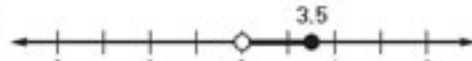
33. no solution



35. $-3 < x < 3$




37. $2 < a \leq 3.5$



Selected Answers

39. $r < -4$ or $r \geq -2$ 


41. $t \geq 4$ or $t < -8$ 


43. ± 8 45. $-11, -1$ 47. $-14, 28$ 49. no solution

51. $-1, 1$ 53. no solution

55. $-3 \leq x \leq 3$ 

57. $s < -1.2$ or $s > 1.2$ 

59. $x < -8$ or $x > 4$ 

61. $5 < m < 11$ 

63. $-1 \leq p \leq 7$ 

65. $-\frac{3}{5} \leq a \leq 1$ 