

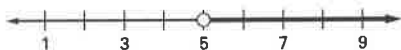
## Answers for 6.3

For use with pages 372–374

### 6.3 Skill Practice

- equivalent inequalities
- An inequality has no solutions if it is equivalent to a false inequality such as  $0 > 2$ . All real numbers are solutions of the inequality if it is equivalent to a true inequality such as  $0 < 2$ .

3.  $x > 5$



4.  $y \leq -1$



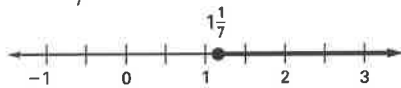
5.  $v \geq -1$



6.  $w < -12$



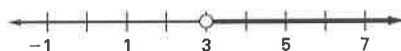
7.  $r \geq 1\frac{1}{7}$



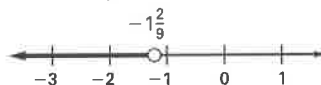
8.  $s \leq 4$



9.  $m > 3$



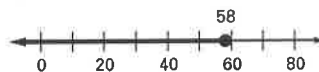
10.  $n < -1\frac{2}{9}$



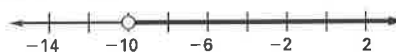
11.  $p < \frac{1}{2}$



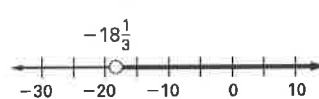
12.  $q \leq 58$



13.  $d > -10$



14.  $f > -18\frac{1}{3}$



15. The inequality symbol was not reversed when dividing both sides by  $-3$ ;  $x \leq -13$ .

16. The distributive property was not used correctly;  $-8x + 12 < 28$ ,  $-8x < 16$ ,  $x > -2$ .

17. all real numbers

18.  $d \geq 0$       19.  $s \geq 0$

20. all real numbers

21. all real numbers

22. all real numbers

23. no solution      24. no solution

25. no solution

26. all real numbers

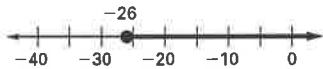
27. no solution      28. no solution

**Answers for 6.3** *continued*  
For use with pages 372–374

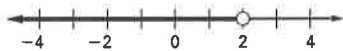
29.  $3x + 4 < 40; x < 12$



30.  $2(x + 8) \geq -36; x \geq -26$



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



32.  $6(6x - 3) \leq -2(4 + 8x); x \leq \frac{5}{26}$



33. C

34.  $9(x + 2) > 81; x > 7$

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

36. -15

**6.3 Problem Solving**

37. at most 11 songs

38. at least 6 ornaments

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

40. C

41. a.

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

b.  $53 + 3p \leq 150, 9 \leq 17\frac{1}{3},$   
 $p \leq 17$  pitches

42. a. 5%; the amount that was taxed was  $\$300 - \$175 = \$125$ . To find the tax rate, solve the proportion  $\frac{x}{100} = \frac{6.25}{125}$ .

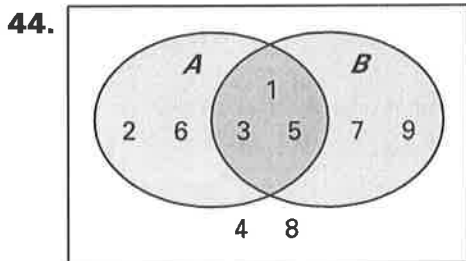
b.  $p + 0.05(p - 175) \leq 400,$   
 $p \leq 389.29; \text{ up to } \$389.29$

**Answers for 6.3** *continued*  
 For use with pages 372–374

- 42. c.** More than \$875; for price  $p > 400$ , the tax paid in the 4% sales tax state is  $0.04p$ , and the tax paid in the other state is  $0.05(p - 175)$ , or  $0.05p - 8.75$ . To find the values of  $p$  for which the first expression is less than the second, solve the inequality  $0.04p < 0.05p - 8.75$  to get  $p > \frac{8.75}{0.01}$ , or  $p > 875$ . Check  $p = \$900$ : The tax paid in the 4% sales tax state is  $0.04(\$900) = \$36$  and the tax paid in the other state is  $0.05(\$900) - \$175 = \$36.25$ .

**43.** at least 196

**6.3 Mixed Review**



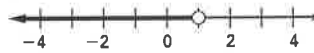
false; 7 and 9 are odd numbers less than 10 that are not factors of 30.

- 45.**  $11y^2$       **46.**  $-12y$   
**47.**  $-9x - 2$       **48.**  $2x + 4$

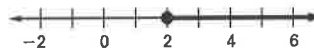
**49.**  $8x + 43$

**50.**  $\frac{5}{2}x - 3$

**51.**  $x < 1$



**52.**  $y \geq 2$



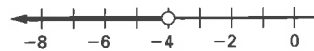
**53.**  $z \geq -4$



**54.**  $m < 12.2$



**55.**  $n < -4$



**56.**  $p \geq 13$



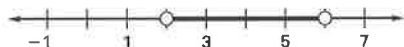
## Answers for 6.4

For use with pages 384-389

### 6.4 Skill Practice

1. compound inequality
2. The graph of  $-6 \leq x \leq -4$  consists of  $-6$ ,  $-4$  and all the points on the number line between  $-6$  and  $-4$ . The graph of  $x \leq -6$  or  $x \geq -4$  consists of  $-6$  and all the points on the number line to the left of  $-6$ , along with  $-4$  and all the points on the number line to the right of  $-4$ .

3.  $2 < x < 6$



4.  $x \leq -8$  or  $x > 12$



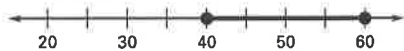
5.  $-1.5 \leq x < 9.2$



6.  $x \leq -10$  or  $x \geq -7\frac{1}{2}$



7.  $40 \leq s \leq 60$



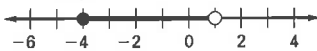
8.  $t < 60$  or  $t > 75$



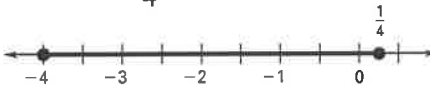
9.  $1 < x \leq 6$



10.  $-4 \leq y < -1$



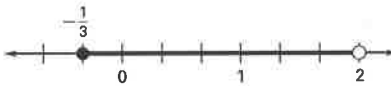
11.  $-4 \leq m \leq \frac{1}{4}$



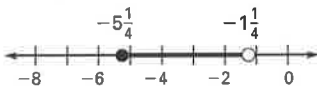
12.  $-5 < n < 4$



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



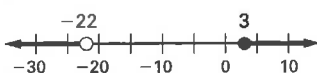
14.  $-5\frac{1}{4} \leq q < -1\frac{1}{4}$



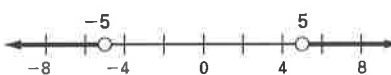
15.  $r < 2$  or  $r \geq 7$



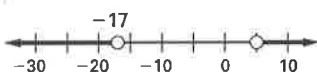
16.  $s < -22$  or  $s \geq 3$



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



18.  $w < -17$  or  $w > 5$



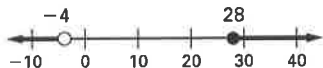
19.  $g < -2\frac{1}{3}$  or  $g > 10$



## Answers for 6.4 *continued*

For use with pages 384–389

20.  $h < -4$  or  $h \geq 28$



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



22. The graph should include the points of the number line to the left on  $-10$  and to the right of  $7$ , not the points between  $-10$  and  $7$ .



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



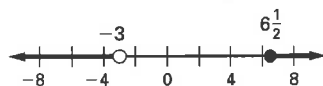
24.  $-4 < x - 3 < -1$ ;  $-1 < x < 2$



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



26.  $-2x + 8 \leq -5$  or  $6 < -2x$ ;  
 $x < -3$  or  $x \geq 6\frac{1}{2}$



27. C

28. False. *Sample answer:*  $a = -5$

29. true

30. True; any solution of  $x < 5$  and  $x \geq -4$  lies between  $-4$  and  $5$  on the number line, so it is to the left of  $5$  and is therefore a solution of  $x < 5$ .

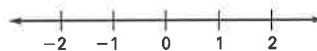
31. False. *Sample answer:*  $a = -3$  is a solution of  $x > 5$  or  $x \leq -4$ , but it is not a solution of  $x > 5$ .

32. a.  $x + 5 > 7, x > 2; 5 + 7 > x,$   
 $x < 12; x + 7 > 5, x > -2$

b.  $2 < x < 12$

c. *Sample answer:* 3, 7, 10

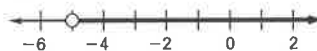
33. no solution



34.  $y > 7$



35.  $m > -5$



36. all real numbers



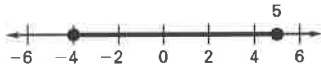
### 6.4 Problem Solving

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



**Answers for 6.4** *continued*  
For use with pages 384–389

38.  $-4 \leq t \leq 5$



39. C

40.  $5319 \leq p \leq 73,486$

41.  $3.2 \text{ lb} \leq f \leq 6.4 \text{ lb}$

42. less than 129.31 cm or greater than 189.66 cm

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.  $23^\circ\text{F}, 239^\circ\text{F};$

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

44. from  $10^\circ\text{F}$  to  $15^\circ\text{F}$

45. a.  $8 \leq \frac{w}{300} \leq 10,$   
 $2400 \leq w \leq 3000; 2400 \text{ watts}$   
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 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.

46. from \$34.78 up to \$69.57

**6.4 Mixed Review**

47. 42                      48. 384

49. 1                        50. 40

51.  $-\frac{1}{4}$                     52.  $-1\frac{2}{7}$

53. -4                      54. -1

55.  $C = 14.5p + 15$

**6.1–6.4 Mixed Review of Problem Solving**

1. a. from  $122^\circ\text{F}$  to  $932^\circ\text{F}$



c. No; the thermometer cannot measure temperatures higher than  $932^\circ\text{F}$ .

2. a.  $x \geq 78$

b. No; with a score of 100 your average will be  $\frac{402 + 100}{6} = \frac{502}{6} \approx 84$ .

**Answers for 6.4** *continued*  
For use with pages 384–389

3. 3 cartons;

			3
	⊘	⊘	
•	•	•	•
	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

4. a. up to \$130

b.  $4.75s \leq 130$ ; up to 27 pairs of socks

5. *Sample answer:* The solution  $x \leq 14.12$  means that the greatest number that will make the inequality true is 14.12.

6. a. at most  $213\frac{1}{3}$  lb

b. Yes; since the most the adults weigh is 200 pounds, and that is less than what the average weight needs to be, all the people and baggage can be accommodated on the raft.

7. a.  $18 \leq t \leq 300$

b. Greater than \$10,000; their taxes are higher than \$300, the highest tax paid by people with annual incomes of \$10,000 or less; from \$12,000 up to \$19,000.

c. Greater than \$20,000; the inequality to describe the situation is  $0.04x < 0.03(10,000) + 0.05(x - 10,000)$ . Solving the inequality gives  $x > \$20,000$ .

## Answers for 6.5

For use with pages 393–395

### 6.5 Skill Practice

1. absolute value equation
2. The absolute deviation of  $x$  from 9 is 5.
3. 5,  $-5$
4. 36,  $-36$
5. 0.7,  $-0.7$
6. 9.2,  $-9.2$
7.  $\frac{1}{2}$ ,  $-\frac{1}{2}$
8.  $\frac{7}{4}$ ,  $-\frac{7}{4}$
9. 4,  $-10$
10.  $5\frac{3}{4}$ ,  $-3\frac{1}{4}$
11.  $-1$ ,  $-3\frac{2}{3}$
12.  $-7$ ,  $-11$
13. 2,  $-9$
14. 22,  $-6$
15. 4, 9
16. 7,  $-5$
17.  $8\frac{1}{2}$ ,  $-3\frac{1}{2}$
18. 1,  $-4\frac{1}{3}$
19.  $-\frac{1}{2}$ ,  $-2\frac{1}{2}$
20. 0,  $-\frac{2}{5}$
21. The absolute value symbol was removed without writing the second equation,  $x + 4 = -13$ ;  $x = 9$  or  $x = -17$ .
22. The absolute value of a number is never negative, so it is incorrect to rewrite this absolute value equation as two equations; there are no solutions.
23. no solution
24. no solution
25.  $-4.5$ ,  $-5.5$
26. no solution
27.  $-3$ , 6
28.  $-5$ ,  $-10$
29.  $13\frac{1}{2}$ ,  $14\frac{1}{2}$
30. no solution
31.  $\frac{1}{4}$ ,  $-1\frac{1}{4}$
32. D
33. 13,  $-3$
34. 25, 15
35.  $-7.5$ ,  $-10.7$
36. 3.3,  $-10.1$
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.
38.  $x - 3 = 4 = 8$ ; 7,  $-1$
39.  $5 = 2x + 9 = 15$ ;  $-3$ ,  $-6$
40. Yes; no; yes; when  $a = 3$  and  $x = -2$ ,  $3 = -2 = 3(2) = 6 = -6 = 3(-2)$ ; when  $a = -3$  and  $x = -2$ ,  $-3 = -2 = -3(2) = -6 \neq 3(-2)$ ; when  $a = 0$  and  $x = -2$ ,  $0 = -2 = 0(-2)$ .
41. one, two

### 6.5 Problem Solving

42. 39 in., 45 in.
43. 235 sec, 245 sec
44. C
45. a. 52.462 points, 56.888 points  
b. 0.3 point
46. 11.4 carats, 12.6 carats



**Answers for 6.5** *continued*  
 For use with pages 393–395

47. a.  $p = s - 450$

b. 300 points, 600 points

48. a. 1920                      b. 2019

c. No; if you substitute 4 for  $p$  in the model, the equation has no solution.

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.

50.  $t = 115.76 \approx 115.76$

**6.5 Mixed Review**

51.  $y = \frac{2}{3}x - 1$

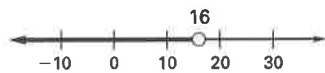
52.  $y = -\frac{1}{2}x + 2$

53.  $y = -\frac{2}{3}x - \frac{5}{3}$

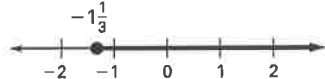
54.  $x \geq 21$



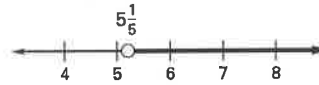
55.  $s < 16$



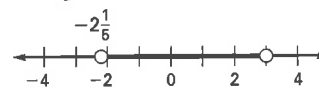
56.  $t \leq -1\frac{1}{3}$



57.  $v > 5\frac{1}{5}$



58.  $-2\frac{1}{5} < w < 3$



59.  $x < -3$  or  $x \geq 2$

