

Answers to Unit 10

SECTION 1 Pages 357-360

Example 2 $A = \{-9, -7, -5, -3, -1\}$

Example 6 $A \cup B = \{-2, -1, 0, 1, 2, 3, 4\}$

Example 10 $A \cap B = \emptyset$

Example 14 $\{x | x > -3, x \in \text{real numbers}\}$

Example 16 The solution set is the numbers greater than -2 .



Example 20 The solution set is the real numbers.



Example 4 $A = \{1, 3, 5, \dots\}$

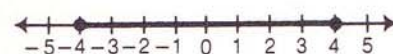
Example 8 $C \cap D = \{10, 16\}$

Example 12 $\{x | x < 59, x \text{ is a positive even integer}\}$

Example 18 The solution set is the numbers greater than -1 and the numbers less than -3 .



Example 22 The solution set is the numbers which are less than or equal to 4 and greater than or equal to -4 .



Pages 361-362

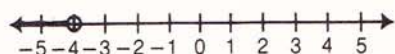
1. $A = \{16, 17, 18, 19, 20, 21\}$ 3. $A = \{9, 11, 13, 15, 17\}$ 5. $A = \{b, c\}$ 7. $A = \{1, 4, 9, 16, 25, 36, 49\}$
 9. $A \cup B = \{3, 4, 5, 6\}$ 11. $A \cup B = \{-10, -9, -8, 8, 9, 10\}$ 13. $A \cup B = \{a, b, c, d, e, f\}$ 15. $A \cup B = \{1, 3, 7, 9, 11, 13\}$ 17. $A \cap B = \{4, 5\}$ 19. $A \cap B = \emptyset$ 21. $A \cap B = \{c, d, e\}$ 23. $A \cap B = \{7, 11\}$
 25. $\{x | x > -5, x \text{ is a negative integer}\}$ 27. $\{x | x > 30, x \text{ is an integer}\}$ 29. $\{x | x > 5, x \text{ is an even integer}\}$
 31. $\{x | x > 8, x \in \text{real numbers}\}$ 33. $\{x | x > -5, x \in \text{real numbers}\}$



SECTION 2 Pages 363-366

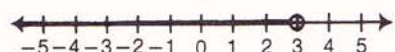
Example 2

$$\begin{aligned} x + 2 &< -2 \\ x + 2 + (-2) &< -2 + (-2) \\ x &< -4 \end{aligned}$$



Example 6

$$\begin{aligned} 3x &< 9 \\ \frac{1}{3}(3x) &< \frac{1}{3}(9) \\ x &< 3 \end{aligned}$$



Example 4

$$\begin{aligned} 5x + 3 &> 4x + 5 \\ 5x + (-4x) + 3 &> 4x + (-4x) + 5 \\ x + 3 &> 5 \\ x + 3 + (-3) &> 5 + (-3) \\ x &> 2 \end{aligned}$$

Example 8

$$\begin{aligned} -\frac{3}{4}x &\geq 18 \\ -\frac{4}{3}\left(-\frac{3}{4}x\right) &\leq -\frac{4}{3}(18) \\ x &\leq -24 \end{aligned}$$

Example 10

Strategy To find the minimum selling price, write and solve an inequality using S to represent the selling price.

Solution

$$0.70S > 314$$

$$\frac{1}{0.70}(0.70S) > \frac{1}{0.70}(314)$$

$$S > 448.57142$$

The minimum selling price is \$448.58.

Pages 367–369

1. $x < 2$

3. $x > 3$

5. $n \geq 3$

7. $x \leq -4$

9. $x \geq -1$

11. $y \geq -9$ 13. $x < 12$

15. $x \geq 5$ 17. $x < -11$ 19. $x \leq 10$ 21. $x \geq -6$ 23. $x > 2$ 25. $d < -\frac{1}{6}$ 27. $x \geq -\frac{31}{24}$ 29. $x < \frac{5}{8}$

31. $x < \frac{5}{4}$ 33. $x > \frac{5}{24}$ 35. $x < -3.8$ 37. $x \leq -1.2$ 39. $x < 5.6$

41. $x > -1.48$

43. $x < 4$

45. $y \geq 3$

47. $x \leq 1$

49. $x < -1$

51. $b < -4$

53. $y \leq -4$ 55. $x > \frac{2}{7}$ 57. $x \leq -\frac{5}{2}$ 59. $x < 16$ 61. $x \geq 16$ 63. $x \geq -14$ 65. $x \leq 21$ 67. $x < \frac{7}{6}$

69. $x \leq -\frac{12}{7}$ 71. $x > \frac{2}{3}$ 73. $x \leq \frac{2}{3}$ 75. $x \leq 2.3$ 77. $x < -3.2$ 79. $x \leq 5$ 81. $x < -5.4$

83. $y \geq -3.15$ 85. $x > -8.22$ 87. $x \leq 7$

Page 370

1. $x > 18$. The smallest integer that satisfies the inequality is 19. 3. $x \leq \frac{3}{2}$. The largest number that will satisfy the inequality is $\frac{3}{2}$. 5. $N \geq 73$. The student's score on the last test must be equal to or greater than 73. 7. $C \geq 1190$. The minimum commission during the fourth month must be \$1190. 9. $P > 613.63636$. The minimum selling price is \$613.64.

SECTION 3 Pages 371–372

Example 2

$$\begin{aligned}5 - 4x &> 9 - 8x \\5 - 4x + 8x &> 9 - 8x + 8x \\5 + 4x &> 9 \\5 + (-5) + 4x &> 9 + (-5) \\4x &> 4 \\x &> 1\end{aligned}$$

Example 4

$$\begin{aligned}8 - 4(3x + 5) &\leq 6(x - 8) \\8 - 12x - 20 &\leq 6x - 48 \\-12 - 12x &\leq 6x - 48 \\-12 - 12x + (-6x) &\leq 6x + (-6x) - 48 \\-12 - 18x &\leq -48 \\-12 + 12 - 18x &\leq -48 + 12 \\-18x &\leq -36 \\-\frac{1}{18}(-18x) &\geq -\frac{1}{18}(-36) \\x &\geq 2\end{aligned}$$

Example 6

- Strategy** To find the maximum number of miles:
- ▷ Write an expression for the cost of each car, using x to represent the number of miles driven during the week.
 - ▷ Write and solve an inequality.

Solution

| | | |
|-------------------------------|--------------------|-------------------------------|
| Cost of a Company A car | is less than | Cost of a Company B car |
|-------------------------------|--------------------|-------------------------------|

$$\begin{aligned}8(7) + 0.10x &< 10(7) + 0.08x \\56 + 0.10x &< 70 + 0.08x \\56 + 0.10x + (-0.08x) &< 70 + 0.08x + (-0.08x) \\56 + 0.02x &< 70 \\56 + (-56) + 0.02x &< 70 + (-56) \\0.02x &< 14 \\ \frac{1}{0.02}(0.02x) &< \frac{1}{0.02}(14) \\x &< 700\end{aligned}$$

The maximum number of miles is 699.

Page 373

1. $x < 4$ 3. $x < -4$ 5. $x \geq 1$ 7. $x \leq 5$ 9. $x < 0$ 11. $x < 20$ 13. $x > 500$ 15. $x > 2$
17. $x \leq -5$ 19. $y \leq \frac{5}{2}$ 21. $x < \frac{25}{11}$ 23. $x > 11$ 25. $n \leq \frac{11}{18}$ 27. $x \geq 6$

Page 374

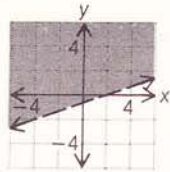
1. $x < -10$. The largest integer that will satisfy the inequality is -11 .
14 ft. 5. $x < 150$. The maximum number of miles is 149.
9. $x < 350$. The maximum number of miles is 349.
3. $x > 5$. The minimum length of the rectangle is 5.
7. $A \leq 50$. The maximum amount of fat is 50 lb.

SECTION 4

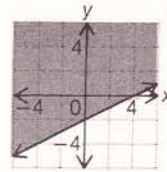
Pages 375-376

Example 2

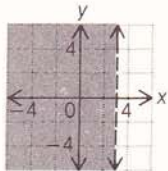
$$\begin{aligned}x - 3y &< 2 \\x + (-x) - 3y &< -x + 2 \\-3y &< -x + 2 \\-\frac{1}{3}(-3y) &> -\frac{1}{3}(-x + 2) \\y &> \frac{1}{3}x - \frac{2}{3}\end{aligned}$$

**Example 4**

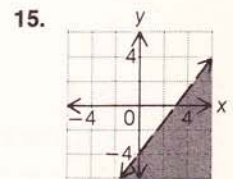
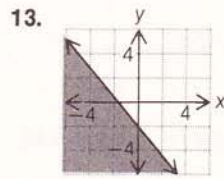
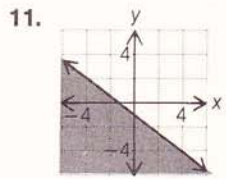
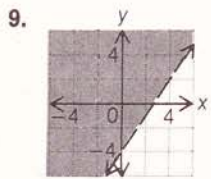
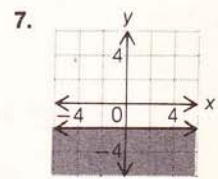
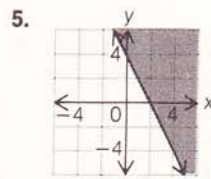
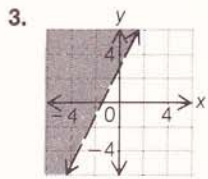
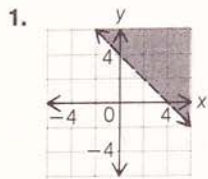
$$\begin{aligned}2x - 4y &\leq 8 \\2x + (-2x) - 4y &\leq -2x + 8 \\-4y &\leq -2x + 8 \\-\frac{1}{4}(-4y) &\geq -\frac{1}{4}(-2x + 8) \\y &\geq \frac{1}{2}x - 2\end{aligned}$$

**Example 6**

$$x < 3$$



Pages 377-378



REVIEW/TESTS

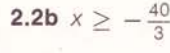
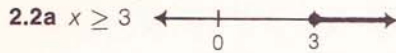
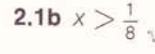
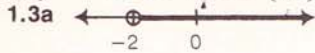
Pages 379-380

1.1a $A = \{4, 6, 8\}$
numbers)

1.1b $A \cap B = \{12\}$

1.2a $\{x | x < 50, x \text{ is a positive integer}\}$

1.2b $\{x | x > -23, x \in \text{real}\}$



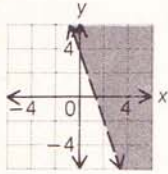
2.3 $x < -8$. The largest integer that will satisfy the inequality is -9 .

3.1a $x \leq -3$.

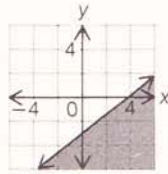
3.1b $x < -\frac{22}{7}$

3.2 The maximum width is 11 ft.

4.1a



4.1b



Pages 381-382

1.1a a

1.1b c

1.2a a

1.2b d

1.3a a

1.3b c

2.1a c

2.1b c

2.2a b

2.2b d

2.3 c

3.1a d

3.1b b

3.2 d

4.1a a

4.1b c