Chapter 4,5 review

Sections labeled at the start of the related problems

4.1 Classify as equivalent inequalities, equivalent equations, equivalent expressions, or not equivalent.

1) $-\frac{1}{4}v \le -7$, $v \ge 28$

Choose the number that is a solution of the inequality.

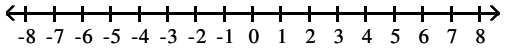
2) $-3n - 7 \le -4n - 18$

A) −9 B) −8

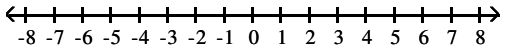
C) −10 D) −11

Graph the inequality and write the solution set using both set–builder notation and interval notation.

3) $x < -7$



4) $x \ge 6$



Solve and graph the inequality. Write the solution set using interval notation.

5) $f + 4 < 15$

6) $-\frac{3}{4}x \le -\frac{6}{7}$

7) $9x + 9 > -45$

Solve.

8) $-30r - 5 \le -5(5r - 4)$ Put your answer in interval notation.

Find the domain of the function. Put your answer in set–builder notation.

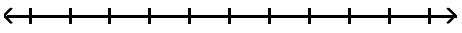
9) $f(x) = \sqrt{6x - 5}$

Solve the inequality.

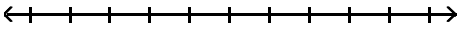
10) A car rental company has two rental rates. Rate 1 is \$45 per day plus \$.18 per mile. Rate 2 is \$90 per day plus \$.09 per mile. If you plan to rent for one week, how many miles would you need to drive to pay less by taking Rate 2?

4.2 Graph the set on the number line.

11) $\{x \mid x < -4 \text{ or } x > 4\}$



12) $\{x \mid x \le 4\}$ and $\{x \mid x \ge -4\}$

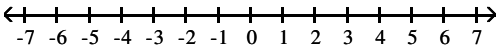


Find the indicated intersection or union.

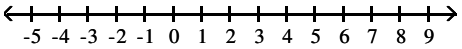
13) Let A = {q, s, u, v, w, x, y, z}, B = {q, s, y, z}, C = {v, w, x, y, z}, and D = {s}. List the elements in the set $A \cup B$.

Graph and write interval notation for the compound inequality.

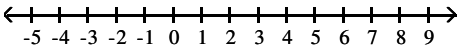
14) $-6 \le x \le -2$



15) $x < 5$ or $x < 7$

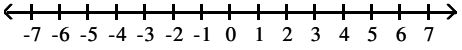


16) $x \ge -4$ or $x < 1$

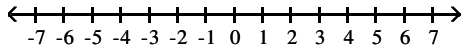


Solve the inequality and graph the solution set.

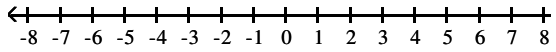
17) $5x - 1 < 4$ and $x - 2 > -1$



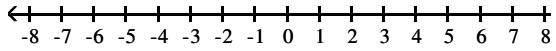
18) $9x - 6 < 3x$ or $-4x \le -12$



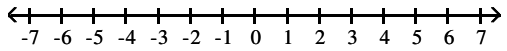
19) $4 \le 4t - 4 \le 16$



20) $-9 \le -2c + 1 < -5$



21) $-6 \le 9x + 3$ and $6x - 2 < 16$



Write the domain of f in interval notation.

22) $f(x) = \dfrac{x + 1}{4x + 5}$

4.3 Classify as either true or false.

23) $|x|$ is always positive.

Solve the equation.

24) $|b + 2| - 8 = 1$

25) $|z| = -7$

26) Let $f(x) = |x| - 5$. Find all x for which $f(x) = 10$.

27) $|5s - 1| = |s + 6|$

28) $|n + 5| = |2 - n|$

Solve the absolute–value inequality.

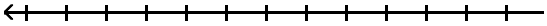
29) $|r - 9| > 9$

30) $|g + 8| < 5$

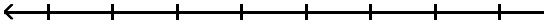
31) $|8y - 5| + 1 < -1$

Solve and graph.

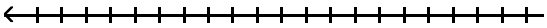
32) $|2k + 2| < -7$



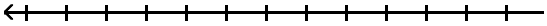
33) $|x - 8| \le 0$



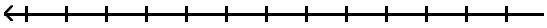
34) $\left|\dfrac{9y + 36}{4}\right| < 9$



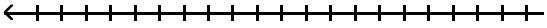
35) $|7k + 6| > -9$



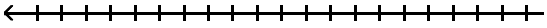
36) $|7k - 7| + 4 > 12$



37) $|4x - 7| > 0$



38) $|11 - 4x| < -1$



Find the requested solution.

39) Let $f(x) = |9 - 8x|$. Find all x for which $f(x) \le 1$.

4.4 Complete the sentence.

40) To indicate that the boundary line is part of the solution, draw it
   A) with arrows at its ends.
   B) as a dashed line.
   C) as a solid line.
   D) with solid dots at its ends.

Choose the ordered pair which is a solution of the inequality.

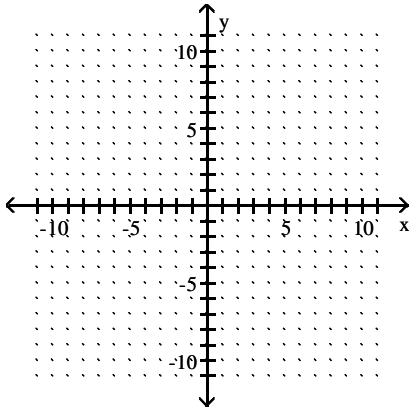
41) $2x + 4y \geq 8$

A) (0, 1) B) (2, 1)

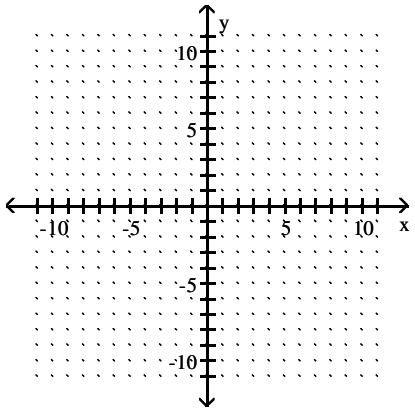
C) (0, 0) D) (1, 1)

Graph on a plane.

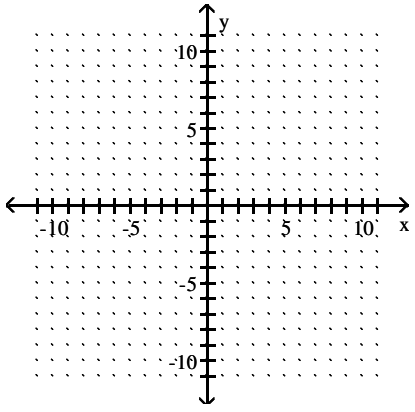
42) $x - y > -6$



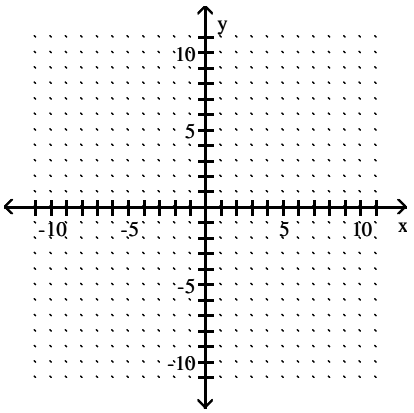
43) $x \geq 5$



44) $2x + y \leq -3$

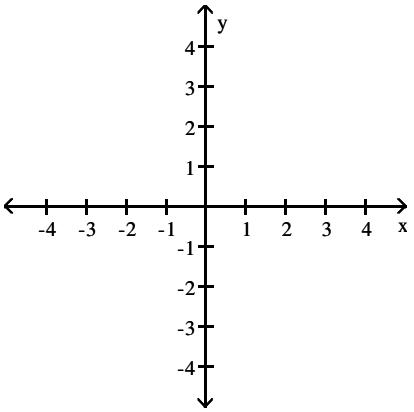


45) $-6 < y < 6$

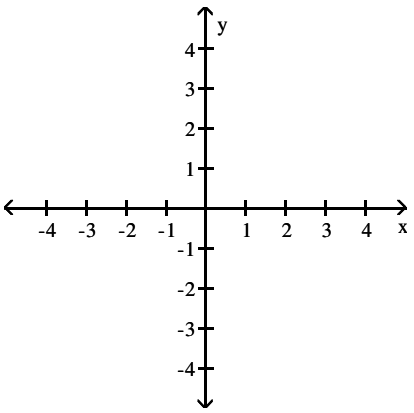


Graph the system of linear inequalities.

46) $3x - 2y \leq 6$ and $x - 1 > 0$

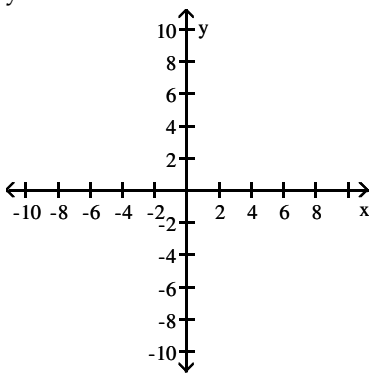


47) $x + 2y \leq 2$ and $x + y \geq 0$

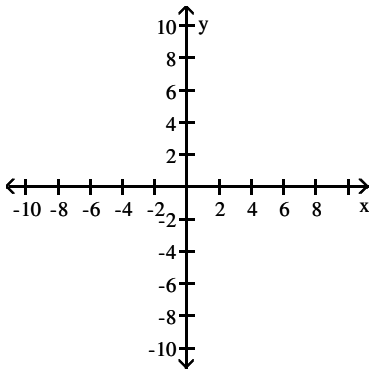


Graph the system of inequalities. Find the coordinates of the vertices.

48) $3y - x \le 9$,
$y + 2x \le 10$,
$y \ge 0$



49) $2y + x \ge -2$,
$y + 3x \le 9$,
$y \le 0$,
$x \ge 0$



5.3 Write an equivalent expression by factoring out the greatest common factor.

50) $12wx - 20wy - 16wz$

Write an equivalent expression by factoring out the greatest common factor.

51) $12c^5 - 60c^3$

52) $24x^9y^7 - 36x^6y^5 + 36x^4y^3$

Factor out a factor with a negative coefficient.

53) $-2x + 6$

54) $-2x^2 + 4x - 12$

Write an equivalent expression by factoring.

55) $3x(5x + 6) - 4(5x + 6)$

56) $18x^2 + 12xy + 15xy + 10y^2$

57) $x^3 - 2x^2 + 9x - 18$

58) $(m + 7)(a - 6) + (m + 7)(a + 1)$

5.4 Factor.

59) $p^2 - 7p + 10$

Factor.

60) $x^2 + 3x - 18$

61) $2x^2 - 2x - 12$

62) $8 - 6z - 9z^2$

63) $21x^2 - 91x - 70$

64) $5x^3 + 5x^2 - 30x$

65) $60x^3 - 5x^2 - 30x$

66) $8x^2 - 18xy + 9y^2$

67) $x^2 - x - 35$

5.5 Factor completely.

68) $z^2 - 14z + 49$

Factor completely.

69) $y^2 - 9$

70) $6pq^4 - 6pr^4$

71) $\frac{1}{49} - p^2$

72) $25 - (x + 4y)^2$

73) $r^2 + 2rs + s^2 - 16$

5.6 Factor completely.

74) $x^3 - 343$

75) $27a^3 - 64b^3$

76) $1000s^3 + 1$

77) $p^6 - 1$

5.7 Factor completely.

78) $32a^4b - 18b^3$

79) $a^4 + a^3 + a + 1$

5.8 Solve the equation.

80) $x^2 - x = 72$

Solve the equation.

81) $6y^2 + 19y + 15 = 0$

82) $12n^2 + 15n = 0$

83) $(x + 7)(x - 7) = -24$

84) $x^4 - 90x^2 + 729 = 0$

85) $x^3 + 10 = 10x^2 + x$

Solve the problem.

86) Let $g(x) = 9x + x^2$. Find a so that $g(a) = -14$.

Find the domain of the function h.

87) $h(x) = \dfrac{-1x}{-9x^2 + 324}$

Solve.

88) Find two consecutive integers such that the sum of their squares is 421.

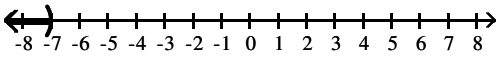
89) The length of a rectangle is 6 inches more than its width. If 3 inches are taken from the length and added to the width, the figure becomes a square with an area of 81 square inches. What are the dimensions of the original figure?

Solve the equation. Round to the nearest tenth, if necessary.

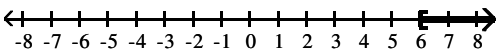
90) If an object is thrown upward from the ground with an initial velocity of 112 ft/sec, its height after t sec is given by $h = 112t - 16t^2$. Find the number of seconds before the object hits the ground.

91) A ball is dropped from a cliff that is 256 ft high. The distance S (in feet) that it falls in t seconds is given by the formula $S = 16t^2$. How many seconds will it take for the ball to hit the ground? Round to the nearest tenth of a second.

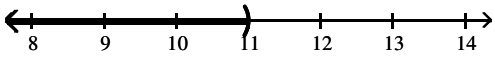
1) Equivalent inequalities
2) D
3) $\{x \mid x < -7\}$, $(-\infty, -7)$



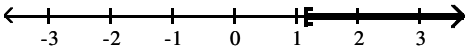
4) $\{x \mid x \geq 6\}$, $[6, \infty)$



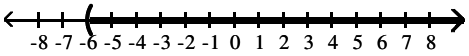
5) $(-\infty, 11)$



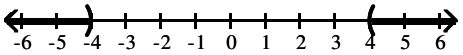
6) $\left[\frac{8}{7}, \infty\right)$



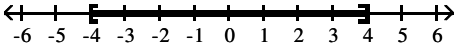
7) $(-6, \infty)$



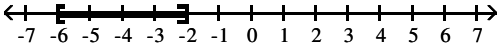
8) $[-5, \infty)$
9) $\left\{x \mid x \geq \frac{5}{6}\right\}$
10) more than 3500 miles
11)



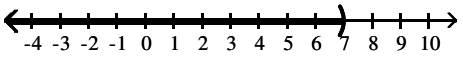
12)



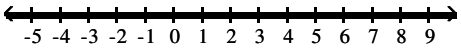
13) {q, s, u, v, w, x, y, z}
14) $[-6, -2]$



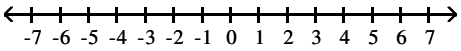
15) $(-\infty, 7)$



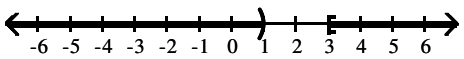
16) $(-\infty, \infty)$



17) $\emptyset$



18)



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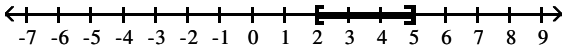

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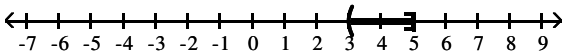

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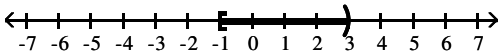


22) $\left(-\infty, -\frac{5}{4}\right] \cup \left(-\frac{5}{4}, \infty\right)$

23) False

24) {7, −11}

25) ∅

26) {−15, 15}

27) $\left\{\frac{7}{4}, -\frac{5}{6}\right\}$

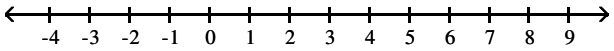
28) $\left\{-\frac{3}{2}\right\}$

29) $(-\infty, 0) \cup (18, \infty)$

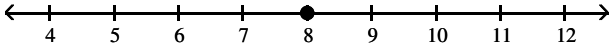
30) (−13, −3)

31) ∅

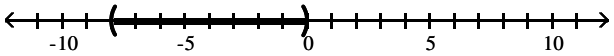
32) ∅



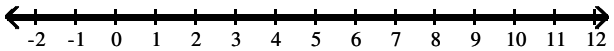
33) 8



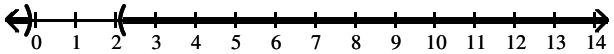
34) (−8, 0)



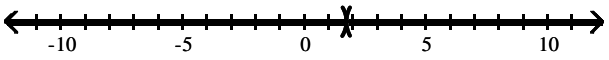
35) $(-\infty, \infty)$



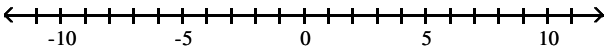
36) $\left(-\infty, -\frac{1}{7}\right] \cup \left(\frac{15}{7}, \infty\right)$



37) $\left(-\infty, \frac{7}{4}\right) \cup \left(\frac{7}{4}, \infty\right)$



38) $\emptyset$

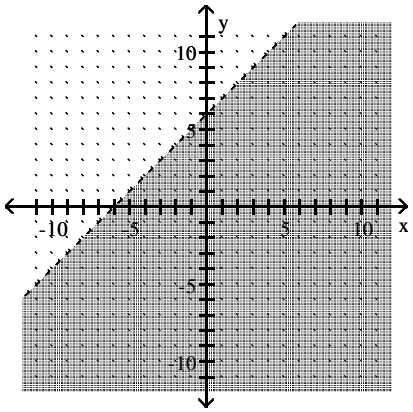


39) $\left[1, \frac{5}{4}\right]$

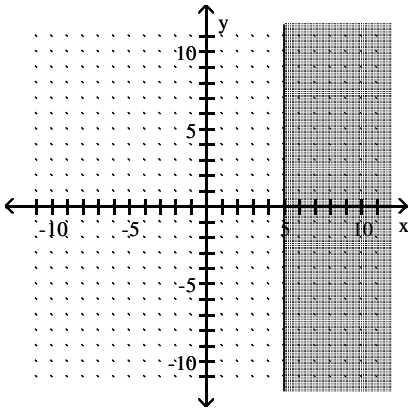
40) C

41) B

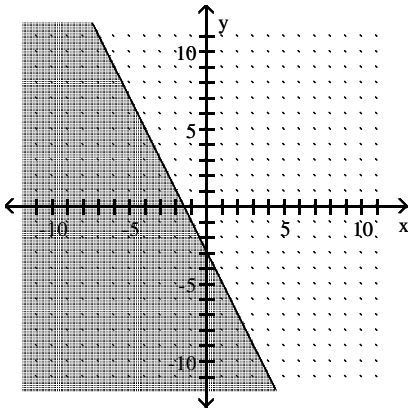
42)



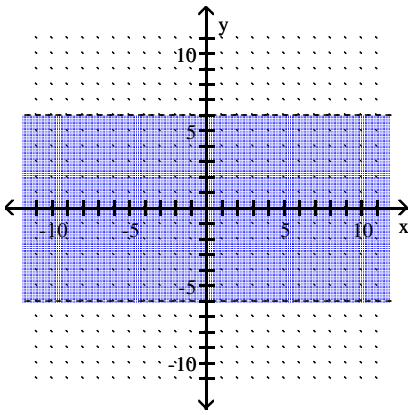
43)



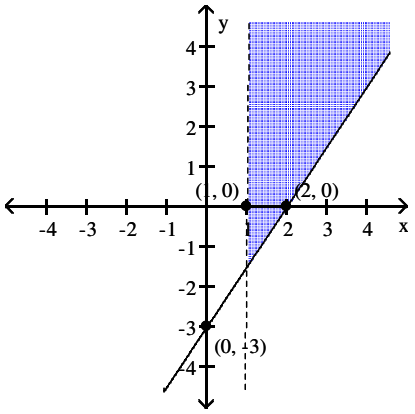
44)


y
10
5
-10
-5
5
10
x
-5
-10

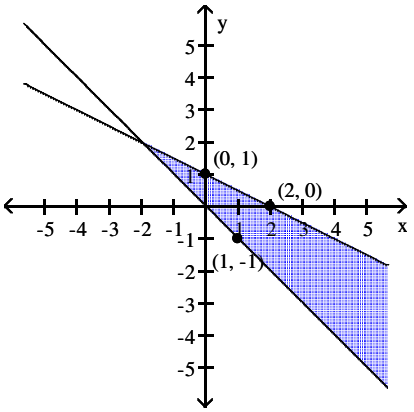
45)


y
10
5
-10
-5
5
10
x
-5
-10

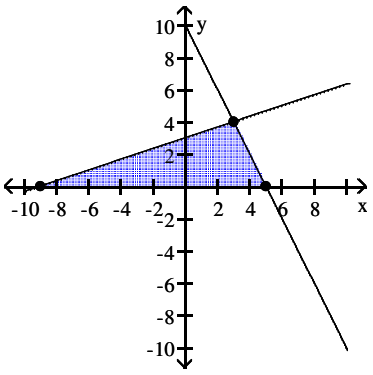
46)


y
4
3
2
1
(, 0)
(2, 0)
-4
-3
-2
-1
1
2
3
4
x
-1
-2
-3
(0, -3)
-4

47)

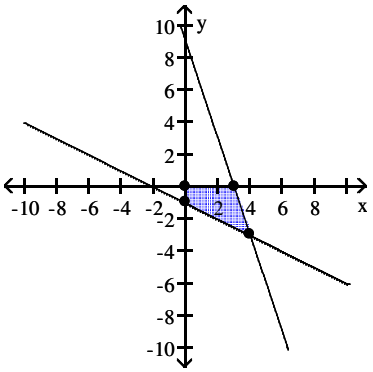


48)



(−9, 0) , (3, 4) , (5, 0)

49)



(0, 0) , (0 , −1) , (3, 0) , (4, −3)

50) $4w(3x - 5y - 4z)$

51) $12c^3(c^2 - 5)$

52) $12x^4y^3(2x^5y^4 - 3x^2y^2 + 3)$

53) $-2(x - 3)$

54) $-2(x^2 - 2x + 6)$

55) $(3x - 4)(5x + 6)$

56) $(6x + 5y)(3x + 2y)$

57) $(x^2 + 9)(x - 2)$

58) $(m + 7)(2a - 5)$
59) $(p - 5)(p - 2)$
60) $(x + 6)(x - 3)$
61) $2(x + 2)(x - 3)$
62) $(4 + 3z)(2 - 3z)$
63) $7(3x + 2)(x - 5)$
64) $5x(x - 2)(x + 3)$
65) $5x(3x + 2)(4x - 3)$
66) $(4x - 3y)(2x - 3y)$
67) Prime
68) $(z - 7)^2$
69) $(y + 3)(y - 3)$
70) $6p(q^2 + r^2)(q + r)(q - r)$
71) $\left(\frac{1}{7} + p\right)\left(\frac{1}{7} - p\right)$
72) $(5 + x + 4y)(5 - x - 4y)$
73) $(r + s + 4)(r + s - 4)$
74) $(x - 7)(x^2 + 7x + 49)$
75) $(3a - 4b)(9a^2 + 12ab + 16b^2)$
76) $(10s + 1)(100s^2 - 10s + 1)$
77) $(p + 1)(p - 1)(p^2 + p + 1)(p^2 - p + 1)$
78) $2b(4a^2 + 3b)(4a^2 - 3b)$
79) $(a + 1)^2(a^2 - a + 1)$
80) $-8, 9$
81) $-\frac{3}{2}, -\frac{5}{3}$
82) $-\frac{5}{4}, 0$
83) $5, -5$
84) $-9, 9, -3, 3$
85) $10, -1, 1$
86) $\{-7, -2\}$
87) $\{x \mid x$ is a real number and $x \neq -6$ and $x \neq 6\}$
88) 14 and 15 or −15 and −14
89) 6 in by 12 in
90) 7 sec
91) 4 sec