2025 Name_____

Pre-Calc Summer Packet

Date_____ Block____

Evaluate each function.

1) $p(a) = -2a - 1$; Find $p(-2)$

2) $w(x) = \left|-2x - 2\right| + 1$; Find $w(-4)$

Find each product.

3) $(6r + 3)(6r - 1)$

4) $(5n + 5)(4n + 8)$

5) $4(7m^2 + 8m + 1)$

6) $5n(4n^2 - 3n - 3)$

7) $(4m - 2)(4m^2 + 6m + 8)$

8) $(2x + 4)(4x^2 - 4x - 4)$

Divide.

9) $(4x^3 + x^2 + 24x) \div 8x$

10) $(2n^4 + 13n^3 + 26n^2 + 6n - 25) \div (n + 3)$

11) $(x^3 - 5x^2 - 9) \div (x - 5)$

Factor each completely.

12) $5m^4 + 50m^2$

13) $x^4 - 9$

14) $3x^3 + 14x^2 - 80x$

15) $5x^4 - 17x^3 + 14x^2$

Factor each.

16) $f(x) = x^2 + 10x + 25$

17) $f(x) = x^2 + 4x + 4$

18) $f(x) = x^3 - 3x^2 - 4x$

19) $f(x) = x^3 - x^2 - 2x$

20) $f(x) = x^3 + 64$

21) $f(x) = x^3 - 8$

22) $f(x) = x^3 + 1$

23) $f(x) = x^3 + 125$

24) $f(x) = x^4 + 7x^2 - 8$

25) $f(x) = x^4 - 2x^2 - 63$

26) $f(x) = x^3 - 16x$

27) $f(x) = x^3 + 4x^2 - 5x - 20$

28) $f(x) = x^3 - x^2 + x - 1$

Solve each equation by taking square roots.

29) $x^2 = 28$

30) $v^2 = -63$

31) $-4m^2 = 32$

32) $x^2 + 8 = 9$

33) $2 + 36n^2 = 102$

34) $3r^2 + 9 = 48$

Solve each equation by factoring.

35) $v^2 - 25 = 0$

36) $x^2 - x - 42 = 0$

37) $p^2 + 48 = 13p + 6$

38) $b^2 - b - 1 = 5$

39) $3x^2 - 22x + 35 = 0$

40) $7m^2 - 46m + 24 = 0$

Solve each equation by completing the square.

41) $n^2 + 2n - 22 = -7$

42) $x^2 + 18x - 13 = 2$

Solve each equation with the quadratic formula.

43) $4r^2 + 3r = 4$

44) $2k^2 = 5k - 10$

Solve each equation. Remember to check for extraneous solutions.

45) $11 = \sqrt{49n} + 4$

46) $\sqrt{1 - 6b} = \sqrt{2b + 9}$

47) $9 = \sqrt{\frac{p}{2}}$

48) $m - 1 = \sqrt{2m + 13}$

Simplify.

49) $\sqrt{72n^2}$

50) $\sqrt{216n}$

51) $\sqrt[3]{40x}$

52) $\sqrt[3]{128n^5}$

53) $\frac{\sqrt{25}}{\sqrt{10}}$

54) $\frac{2\sqrt[5]{2}}{3\sqrt[5]{16}}$

55) $\frac{2}{\sqrt{5}}$

Simplify. Your answer should contain only positive exponents.

56) $mn^{-3} \cdot n^3$

57) $x^0y^{-2} \cdot yx^3$

58) $\left(2x^{-3} \cdot 2xy\right)^{-2}$

59) $y^2 \cdot \left(x^{-2}y^3\right)^{-4}$

60) $\frac{x^4}{\left(x^3y^0\right)^2 \cdot xy^3}$

61) $\frac{x^2y^2 \cdot y^{-1}}{\left(x^4y^3\right)^{-3}}$

Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.

62) $3a^2b^{-\frac{1}{3}} \cdot 4a^{-\frac{5}{4}}b^0$

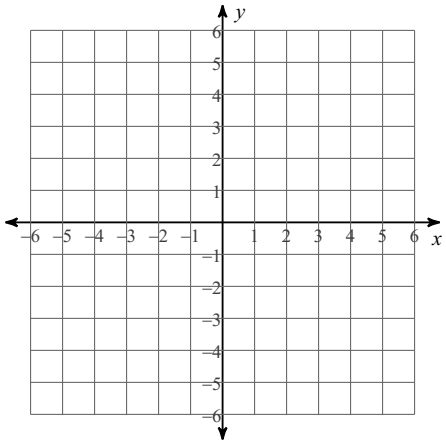
63) $4y^{-\frac{5}{4}} \cdot x^{\frac{1}{2}}y^{\frac{4}{3}}$

64) $\frac{3y \cdot 3x^0y^{\frac{5}{4}}}{3y^2}$

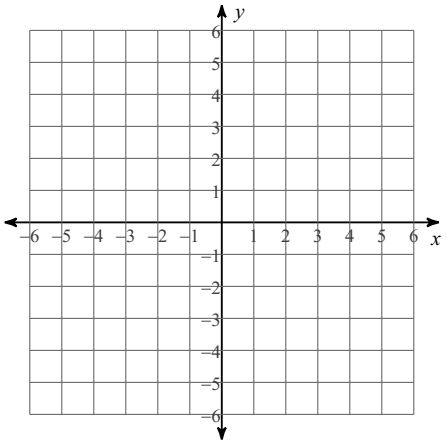
65) $\frac{4y^{-2}}{2yx^2 \cdot 3x^{\frac{1}{2}}y^0}$

Sketch the graph of each line.

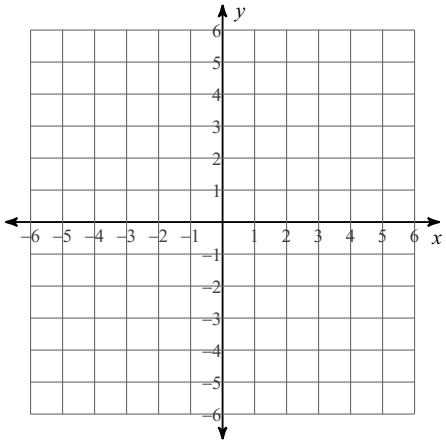
66) $x - y = -2$



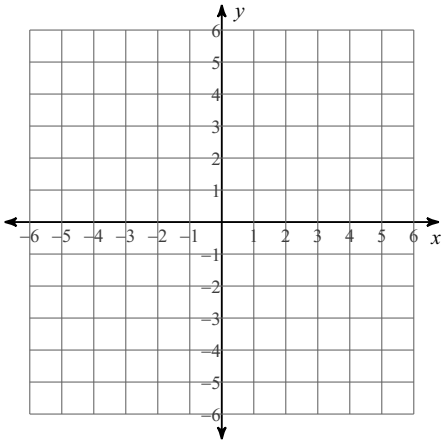
67) $y = -3$



68) $y = x - 3$

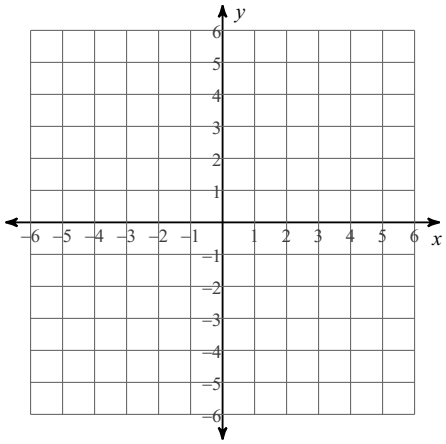


69) $x = 4$

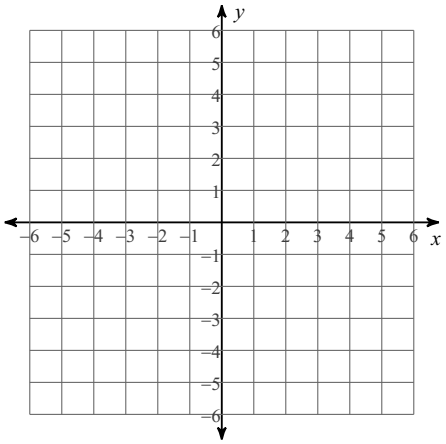


Sketch the graph of each linear inequality.

70) $y < 3$

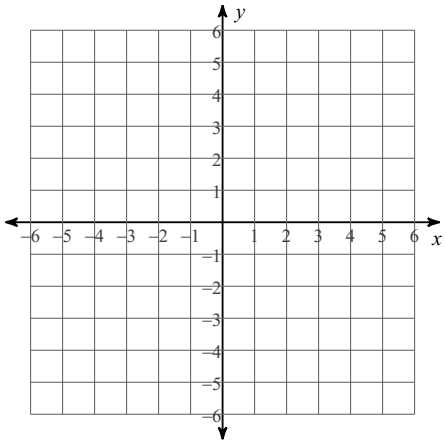


71) $4x + y < -1$

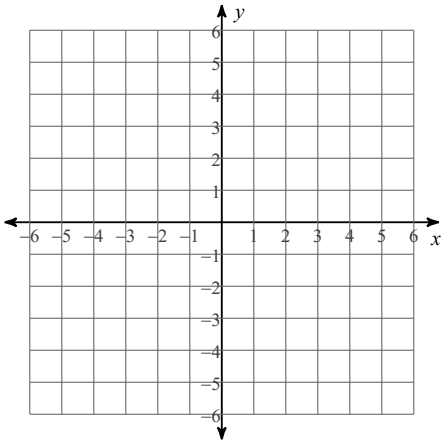


Graph each equation.

72) $y = \left|x + 3\right| + 2$

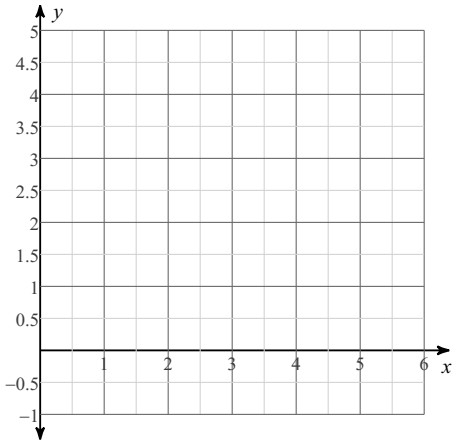


73) $y = -2\left|x - 2\right| + 1$

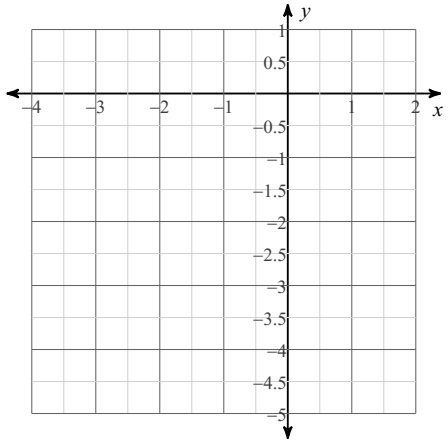


Sketch the graph of each function.

74) $y = -x^2 + 6x - 5$

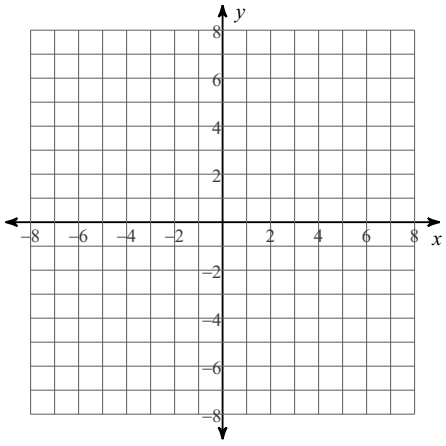


75) $y = (x + 1)^2 - 4$

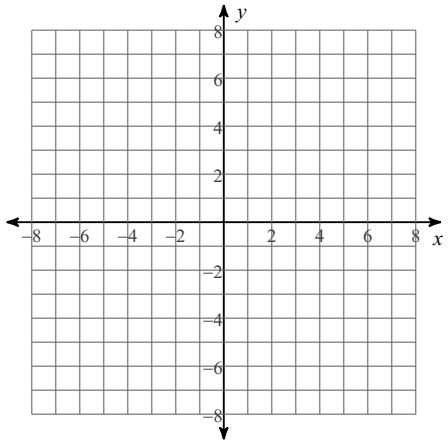


Identify the domain and range of each. Then sketch the graph.

76) $y = \sqrt{x}$

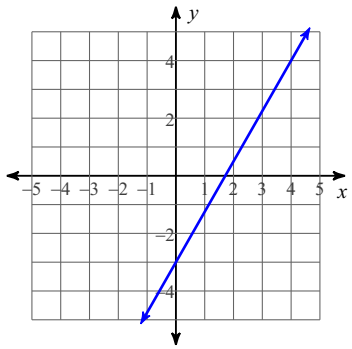


77) $y = \sqrt{x + 2} - 4$



Write the slope-intercept form of the equation of each line.

78)



Write the slope-intercept form of the equation of the line through the given points.

79) through: $(5, 2)$ and $(0, 3)$

Write the slope-intercept form of the equation of the line described.

80) through: $(1, 1)$, parallel to $y = 6x + 3$

81) through: $(4, -2)$, perp. to $y = -\frac{4}{3}x - 3$

Solve each equation.

82) $8(5x - 4) = 8(5x - 3) - 4x$

83) $8(2a - 7) - 8a = 8(a - 6) - 8$

84) $-6\left(\frac{15}{4}x + \frac{5}{6}\right) - \frac{23}{6} = \frac{311}{3}$

85) $|1 - 2x| = 15$

86) $8 - 5|4n + 5| = 3$

87) $|n + 8| = 9$

88) $3 = r^{\frac{1}{3}}$

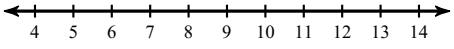
89) $512 = n^{\frac{3}{2}}$

90) $(n + 5)^{\frac{3}{2}} = 729$

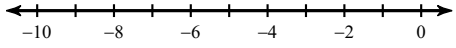
91) $(23 - 2x)^{-\frac{3}{2}} = \frac{1}{729}$

Solve each inequality and graph its solution.

92) $-143 \geq 4 - 3(7n + 7)$

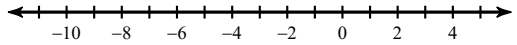


93) $176 > 8(4 - 6x)$

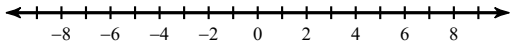


Solve each compound inequality and graph its solution.

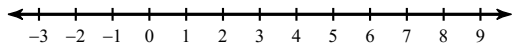
94) $-16 < -8 + a < -5$



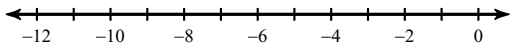
95) $x - 8 > -2$ or $\frac{x}{4} < -1$



96) $14 < 2 + 4x < 34$



97) $-8 - 7x < 20$ or $8 + 9x < -64$



Solve each system by elimination.

98) $-6x + 15y = -16$
$2x - 5y = 6$

99) $4x - 8y = -28$
$3x - 2y = 7$

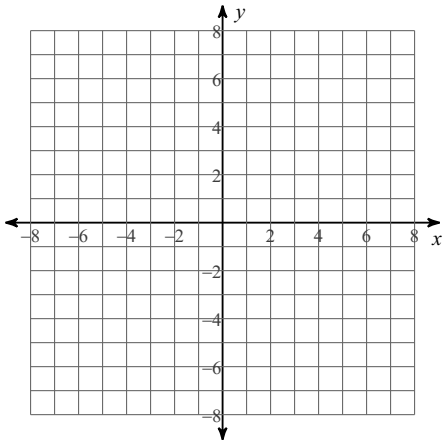
Use the information provided to write the standard form equation of each circle.

100) Center: $(-15, -13)$
Radius: 4

101) Center: $(-14, -2)$
Radius: $\sqrt{21}$

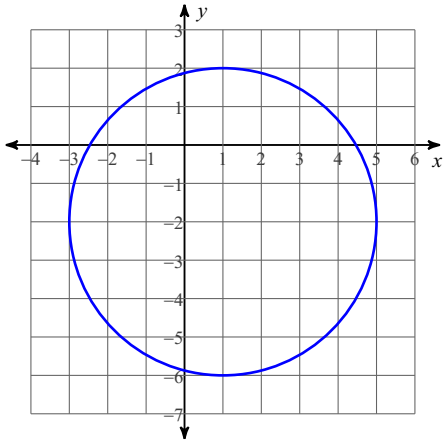
Identify the center and radius of each. Then sketch the graph.

102) $x^2 + (y - 1)^2 = 16$



Use the information provided to write the standard form equation of each circle.

103)



104) Ends of a diameter: $(1, -4)$ and $(-13, 0)$

105) Scott's school is selling tickets to the annual dance competition. On the first day of ticket sales the school sold 12 adult tickets and 7 child tickets for a total of $210. The school took in $72 on the second day by selling 3 adult tickets and 5 child tickets. Find the price of an adult ticket and the price of a child ticket.

Solve each question. Round your answer to the nearest hundredth.

106) Working alone, Jessica can clean an attic in 13 hours. One day her friend Shayna helped her and it only took 5.32 hours. How long would it take Shayna to do it alone?

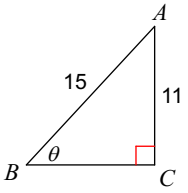
107) Working alone, Dan can wash a car in 10 minutes. Nicole can wash the same car in 15 minutes. If they worked together how long would it take them?

108) Shreya and her brother mixed together two types of soil to make 12 m³ of soil with a 30% sand content. They used 4 m³ of a soil with 38% sand content and 8 m³ of another type of soil. What was the sand content of the second type of soil?

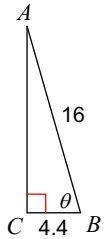
109) 6 ml of a 70% acid solution was mixed with 8 ml of pure water. Find the concentration of the new mixture.

Find the measure of each angle indicated. Round to the nearest tenth.

110)

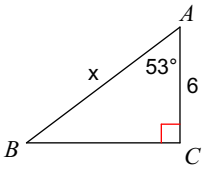


111)

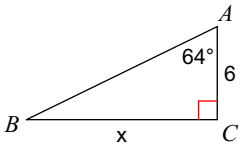


Find the measure of each side indicated. Round to the nearest tenth.

112)



113)



Answers to Pre-Calc Summer Packet

1) 3

2) 7

3) $36r^2 + 12r - 3$

4) $20n^2 + 60n + 40$

5) $28m^2 + 32m + 4$

6) $20n^3 - 15n^2 - 15n$

7) $16m^3 + 16m^2 + 20m - 16$

8) $8x^3 + 8x^2 - 24x - 16$

9) $\frac{x^2}{2} + \frac{x}{8} + 3$

10) $2n^3 + 7n^2 + 5n - 9 + \frac{2}{n+3}$

11) $x^2 - \frac{9}{x-5}$

12) $5m^2(m^2 + 10)$

13) $(x^2 + 3)(x^2 - 3)$

14) $x(3x - 10)(x + 8)$

15) $x^2(5x - 7)(x - 2)$

16) $f(x) = (x + 5)^2$

17) $f(x) = (x + 2)^2$

18) $f(x) = x(x + 1)(x - 4)$

19) $f(x) = x(x - 2)(x + 1)$

20) $f(x) = (x + 4)(x^2 - 4x + 16)$

21) $f(x) = (x - 2)(x^2 + 2x + 4)$

22) $f(x) = (x + 1)(x^2 - x + 1)$

23) $f(x) = (x + 5)(x^2 - 5x + 25)$

24) $f(x) = (x - 1)(x + 1)(x^2 + 8)$

25) $f(x) = (x - 3)(x + 3)(x^2 + 7)$

26) $f(x) = x(x + 4)(x - 4)$

27) $f(x) = (x + 4)(x^2 - 5)$

28) $f(x) = (x - 1)(x^2 + 1)$

29) $\{2\sqrt{7}, -2\sqrt{7}\}$

30) $\{3i\sqrt{7}, -3i\sqrt{7}\}$

31) $\{2i\sqrt{2}, -2i\sqrt{2}\}$

32) $\{1, -1\}$

33) $\left\{\frac{5}{3}, -\frac{5}{3}\right\}$

34) $\{\sqrt{13}, -\sqrt{13}\}$

35) $\{-5, 5\}$

36) $\{-6, 7\}$

37) $\{6, 7\}$

38) $\{-2, 3\}$

39) $\left\{\frac{7}{3}, 5\right\}$

40) $\left\{\frac{4}{7}, 6\right\}$

41) $\{3, -5\}$

42) $\{-9 + 4\sqrt{6}, -9 - 4\sqrt{6}\}$

43) $\left\{\frac{-3 + \sqrt{73}}{8}, \frac{-3 - \sqrt{73}}{8}\right\}$

44) $\left\{\frac{5 + i\sqrt{55}}{4}, \frac{5 - i\sqrt{55}}{4}\right\}$

45) $\{1\}$

46) $\{-1\}$

47) $\{162\}$

48) $\{6\}$

49) $6n\sqrt{2}$

50) $6\sqrt{6n}$

51) $2\sqrt[3]{5x}$

52) $4n\sqrt[3]{2n^2}$

53) $\frac{\sqrt{10}}{2}$

54) $\frac{\sqrt[5]{4}}{3}$

55) $\frac{2\sqrt{5}}{5}$

56) m

57) $\frac{x^3}{y}$

58) $\frac{x^4}{16y^2}$

59) $\frac{x^8}{y^{10}}$

60) $\frac{1}{x^3y^3}$

61) $x^{14}y^{10}$

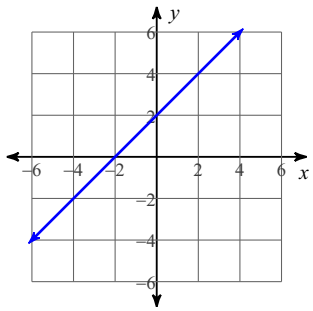
62) $\frac{12b^{\frac{2}{3}}a^{\frac{3}{4}}}{b}$

63) $4y^{\frac{1}{12}}x^{\frac{1}{2}}$

64) $3y^{\frac{1}{4}}$

65) $\frac{2x^{\frac{1}{2}}}{3y^3x^3}$

66)



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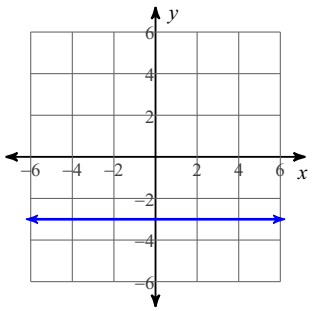

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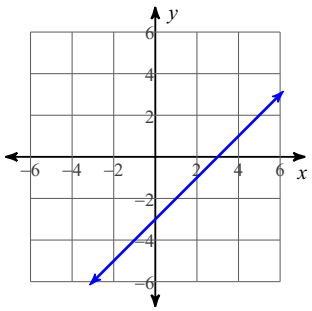
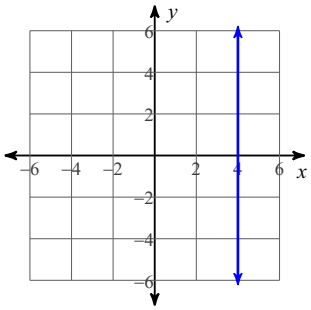
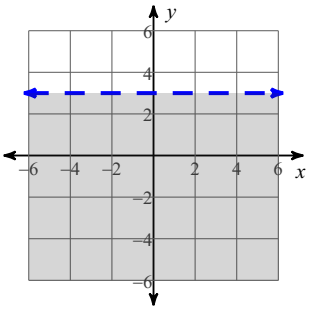
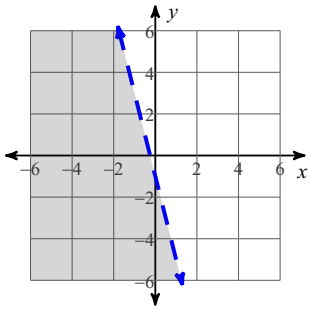
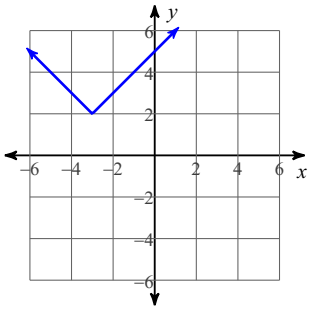
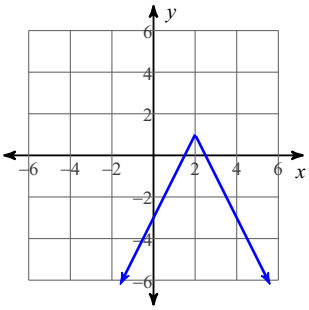


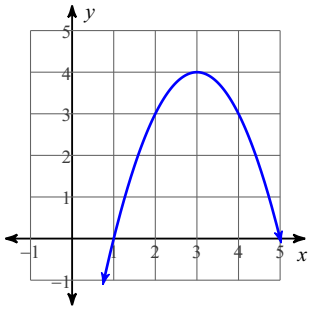
69) 

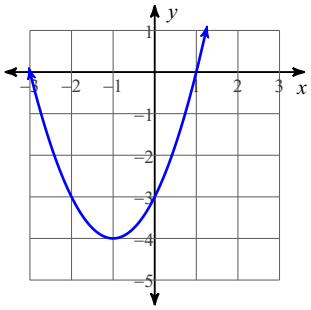
70) 

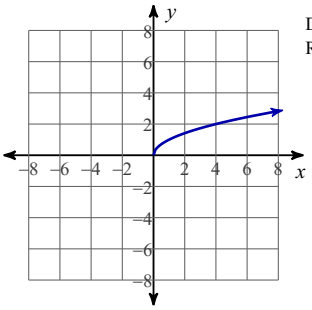
71) 

72) 

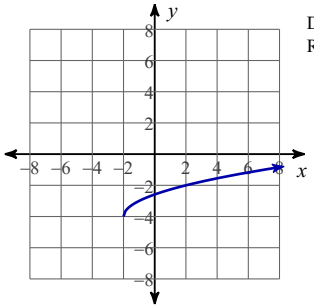
73) 

74) 

75) 

76) 

Domain: $x \geq 0$
Range: $y \geq 0$

77) 

Domain: $x \geq -2$
Range: $y \geq -4$

78) $y = \frac{7}{4}x - 3$

79) $y = -\frac{1}{5}x + 3$

80) $y = 6x - 5$

81) $y = \frac{3}{4}x - 5$

82) $\{2\}$

83) { All real numbers. }

84) $\{-5\}$

85) $\{-7, 8\}$

86) $\left\{-1, -\frac{3}{2}\right\}$

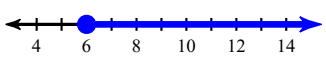
87) $\{1, -17\}$

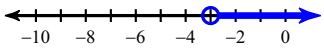
88) $\{27\}$

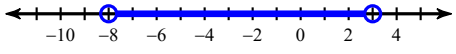
89) $\{64\}$

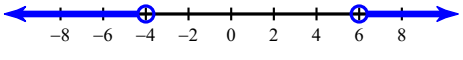
90) $\{76\}$

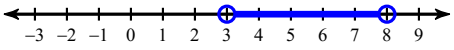
91) $\{-29\}$

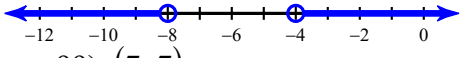
92) $n \geq 6$: 

93) $x > -3$: 

94) $-8 < a < 3$: 

95) $x > 6$ or $x < -4$: 

96) $3 < x < 8$: 

97) $x > -4$ or $x < -8$: 

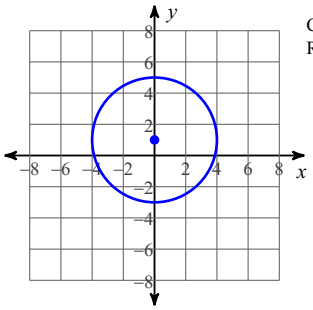
98) No solution

99) $(7, 7)$

100) $(x + 15)^2 + (y + 13)^2 = 16$

101) $(x + 14)^2 + (y + 2)^2 = 21$

102)



103) $(x - 1)^2 + (y + 2)^2 = 16$

104) $(x + 6)^2 + (y + 2)^2 = 53$

105) adult ticket: \$14, child ticket: \$6

106) 9.01 hours

107) 6 minutes

108) 26%

109) 30%

110) 47.2°

111) 74°

112) 10

113) 12.3