Review

Write each as an algebraic expression.

1) a number increased by 8 is equal to 26

2) 8 less than t is equal to 38

Write each as a verbal expression.

3) $n9 > 8 -$

Evaluate each expression.

4) 4 cubed

5) $5 \times (9 \times 2) \div 6$

6) $\dfrac{11 + 1}{2 + 4}$

7) $5 + (-4)$

8) $8 - 1 - 1$

9) $(-5) - (-4) - (-7) + 7$

Evaluate each using the values given.

10) $(x + z + z) \div 2$; use $x = 6$, and $z = 2$

11) $n + p^2 + p$; use $n = 6$, and $p = 3$

Name the set or sets to which each number belongs.

12) 11

Find each product.

13) $(-4)(9)$

14) $(5)(-5)(2)$

15) $4(5n + 4)$

16) $(6b + 7)(3b - 5)$

17) $(4 + 8r)(4 - 8r)$

18) $(1 + 4x)^2$

Find each quotient.

19) $\dfrac{48}{-6}$

20) $-30 \div -3$

Simplify each expression.

21) $1 + 3v + 5v$

22) $-9(x - 6)$

23) $-9 - 10(x - 3)$

24) $-10(a + 8) - 4(3a - 10)$

25) $(8 + 6a - 3a^2) + (5a - 3 - 5a^2)$

26) $(5x^3 + 3x^2 - x) - (x^2 - 7x^3 + 5x)$

27) $\dfrac{9x^2}{10x^2} \cdot \dfrac{3}{2}$

28) $\dfrac{(n - 4)(n + 2)}{(n + 2)(n - 2)} \cdot \dfrac{9n(n - 2)}{9n}$

29) $\dfrac{1}{m - 9} \cdot \dfrac{8m^2 - 64m}{m - 8}$

30) $\dfrac{9}{3r^2} \div \dfrac{3}{4r^3}$

31) $\dfrac{7x(x + 4)}{(x + 4)(x - 4)} \div \dfrac{x + 4}{x - 4}$

32) $\dfrac{1}{n + 6} \div \dfrac{2}{n^2 + n - 30}$

33) $\dfrac{6y}{3} + \dfrac{2x}{3x^3}$

34) $\dfrac{4v}{2v} + \dfrac{2}{9v^2 + 3v}$

Find each percent change. State if it is an increase or a decrease.

35) From 21 inches to 84 inches

Solve each equation.

36) $\dfrac{n}{5} = -\dfrac{1}{5}$

37) $-31 = a + (-17)$

38) $4k - 10 = 2$

39) $42 = -6 - 6x$

40) $2 + 8(x + 5) = 74$

41) $-8(1 + 4n) = -8 + 5n$

42) $-4(8m + 3) - 5m = -5m - 3(m + 4)$

43) $\left| p \right| = 1$

44) $|3x| = 18$

45) $10\left|\dfrac{n}{10}\right| = 8$

46) $\dfrac{|b+2|}{7} = 1$

47) $10 - 5|8 + 2r| = -120$

Solve each equation. Remember to check for extraneous solutions.

48) $\sqrt{x} = 10$

49) $5 = -1 + \sqrt{n}$

50) $\dfrac{1}{4a} = \dfrac{5}{2a} + \dfrac{1}{4}$

51) $-1 = \sqrt{v+1} - 10$

52) $-1 = \sqrt{2x} - 7$

53) $\sqrt{-5 - 2x} = \sqrt{x+4}$

54) $n = \sqrt{2 - n}$

55) $\sqrt{29 - 5k} + 7 = k$

56) $\dfrac{5}{p} = \dfrac{1}{p} - 1$

57) $\dfrac{3}{x+5} = \dfrac{1}{x+5} + 1$

58) $\dfrac{3}{2} + \dfrac{n^2 + 9n + 18}{2n} = \dfrac{1}{2}$

59) $\dfrac{2m + 10}{m^2 - m} + \dfrac{m + 4}{m} = \dfrac{6m + 18}{m - 1}$

Solve each proportion.

60) $\dfrac{r}{9} = \dfrac{6}{8}$

61) $\dfrac{10}{3} = \dfrac{x}{5}$

62) $\dfrac{4}{10} = \dfrac{7}{n - 1}$

63) $-\dfrac{4}{5} = \dfrac{b + 4}{b}$

64) $\dfrac{v + 10}{v + 5} = \dfrac{9}{8}$

65) $\dfrac{7x + 2}{8} = \dfrac{x + 3}{5}$

Solve each problem.

66) 8.2 grams is 6% of what?

67) Kristin made a trip to the train station and back. On the trip there she drove 24 km/h and on the return trip she went 60 km/h. How long did the trip there take if the return trip took two hours?

68) 16 lbs. of mixed nuts containing 20% peanuts were mixed with 10 lbs. of another kind of mixed nuts that contain 72% peanuts. What percent of the new mixture is peanuts?

69) Yellowstone National Park is a popular field trip destination. This year the senior class at High School A and the senior class at High School B both planned trips there. The senior class at High School A rented and filled 13 vans and 11 buses with 401 students. High School B rented and filled 13 vans and 6 buses with 266 students. Each van and each bus carried the same number of students. How many students can a van carry? How many students can a bus carry?

70) The local amusement park is a popular field trip destination. This year the senior class at High School A and the senior class at High School B both planned trips there. The senior class at High School A rented and filled 9 vans and 9 buses with 567 students. High School B rented and filled 3 vans and 10 buses with 539 students. Each van and each bus carried the same number of students. How many students can a van carry? How many students can a bus carry?

71) Yellowstone National Park is a popular field trip destination. This year the senior class at High School A and the senior class at High School B both planned trips there. The senior class at High School A rented and filled 11 vans and 13 buses with 641 students. High School B rented and filled 6 vans and 10 buses with 466 students. Each van and each bus carried the same number of students. Find the number of students in each van and in each bus.

72) Maria left the airport and traveled toward the town hall. Wilbur left one hour later traveling at 65 km/h in an effort to catch up to Maria. After traveling for four hours Wilbur finally caught up. What was Maria's average speed?

73) Eugene created a metal containing 30% platinum by combining 2 kg of pure platinum with 10 kg of another metal. What percent of the other metal was platinum?

74) Huong and Darryl each improved their yards by planting grass sod and ivy. They bought their supplies from the same store. Huong spent $169 on 11 ft² of grass sod and 10 pots of ivy. Darryl spent $44 on 1 ft² of grass sod and 5 pots of ivy. What is the cost of one ft² of grass sod and the cost of one pot of ivy?

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

75) It takes Amy 12 minutes to sweep a porch. Gabriella can sweep the same porch in 13 minutes. If they worked together how long would it take them?

76) Mike can mop a warehouse in 12 hours. One day his friend Jenny helped him and it only took 5.14 hours. How long would it take Jenny to do it alone?

Draw a graph for each inequality.

77) $b < 3$
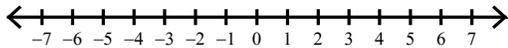
78) $6 < x$
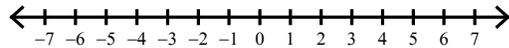
79) $-x \leq -4$
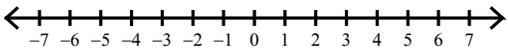

80) $-1 \leq -a$
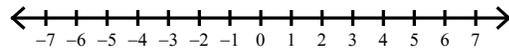
**Write an inequality for each graph.**

81)
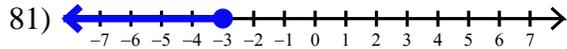
**Solve each inequality and graph its solution.**

82) $5x > 75$
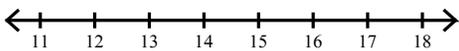

83) $-7x \leq -77$
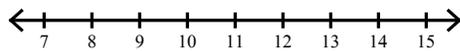
84) $7 \geq \dfrac{n + 8}{3}$
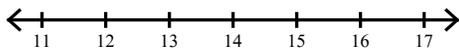
85) $\dfrac{9 + k}{2} \leq -3$
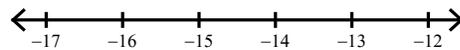

86) $4p + 5(p + 6) \geq 48$
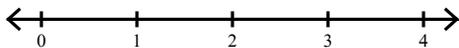
87) $6x + 34 < 2(7x + 1)$
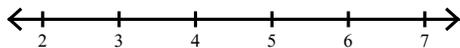
88) $\left| n \right| < 6$
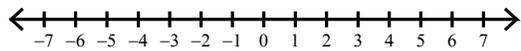
89) $\left| m - 4 \right| \geq 4$
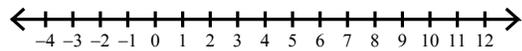
90) $\left| -2r - 8 \right| \geq 6$
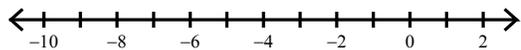
91) $\left| 4 - 8x \right| - 9 \geq 67$
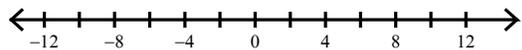
Solve each compound inequality and graph its solution.

92) $-8 + n < -12$ or $3n > 6$
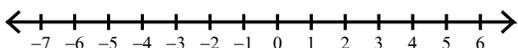
93) $6b - 6 > 36$ or $8b - 2 < -34$
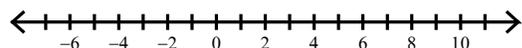
94) $-1 - 9v \geq -10v - 5$ and $5v - 9 \geq 7v - 3$
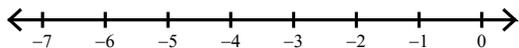
Find the slope of each line.

95)
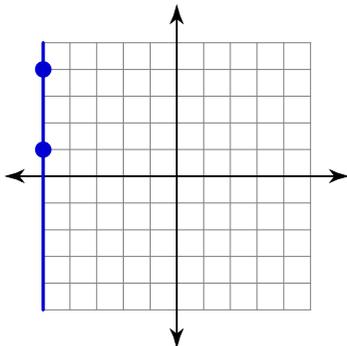
96) $y = -\dfrac{1}{2}x + 4$

97) $2x - y = 5$

Find the slope of the line through each pair of points.

98) $(-20, -10), (10, 8)$

Find the slope of a line parallel to each given line.

99) $y = -x - 4$

Find the slope of a line perpendicular to each given line.

100) $y = \dfrac{1}{4}x - 3$

**Sketch the graph of each line.**

101) x-intercept = 5, y-intercept = −5
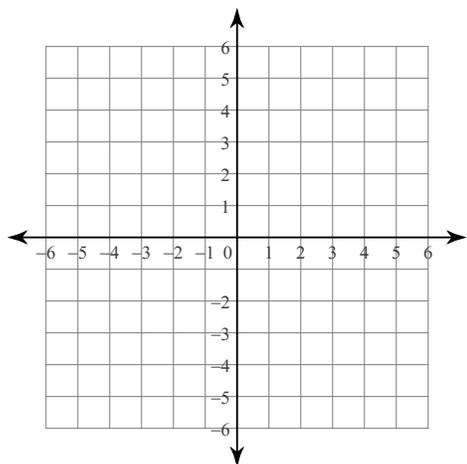
102) $x + y = -4$
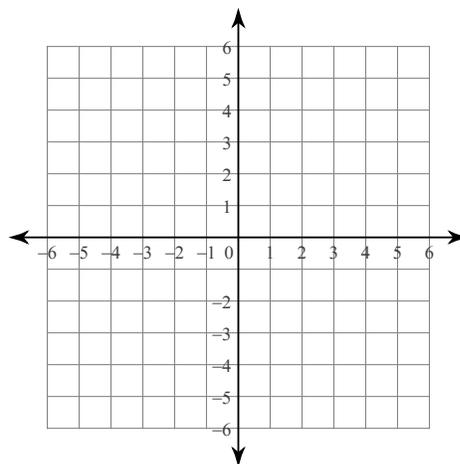
103) $y = -\dfrac{1}{3}x - 2$
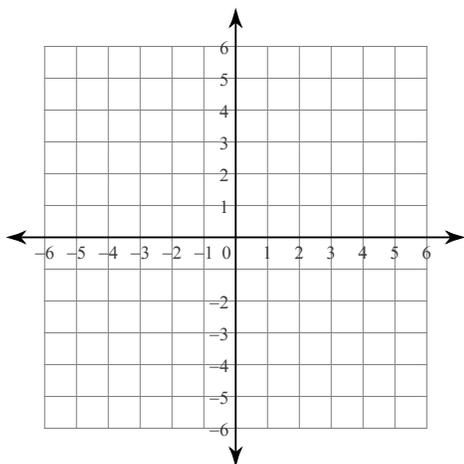
Graph each equation.

104) $y = |x| - 1$
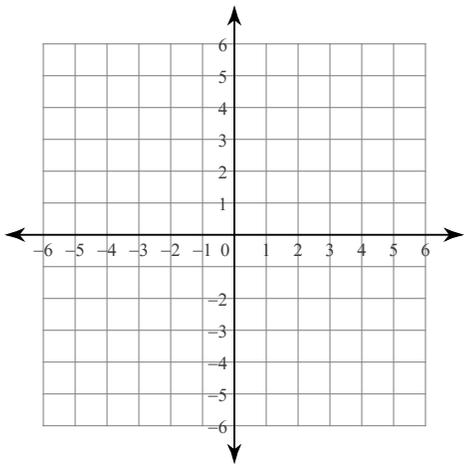
105) $y = -|x - 2|$
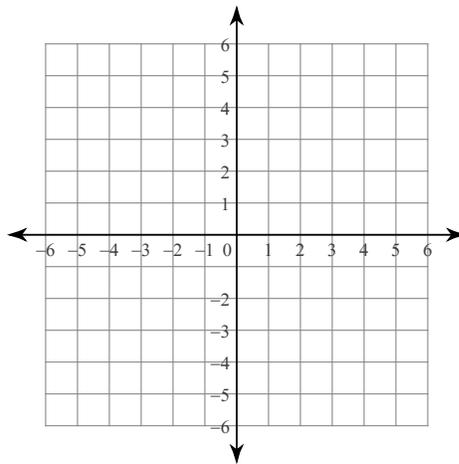
Sketch the graph of each linear inequality.

106) $y > \dfrac{1}{2}x + 3$
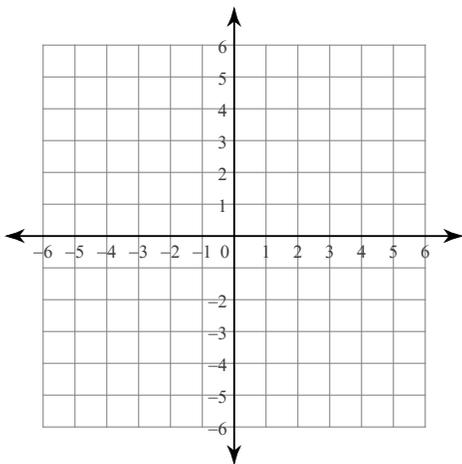
107) $4x + 3y \geq 15$
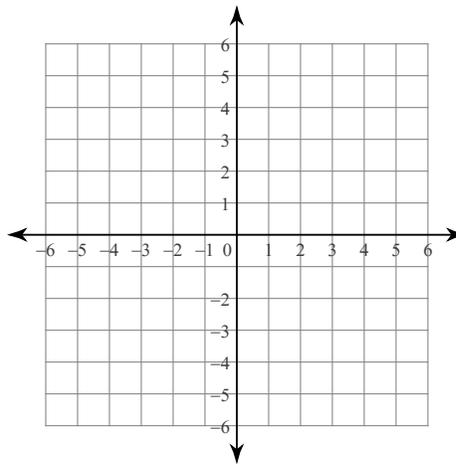
Find the value of each trigonometric ratio.

108) cos A
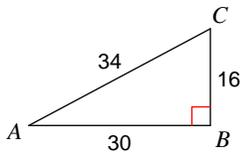
109) cos C
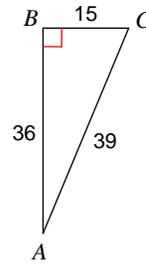
**Find the value of each trigonometric ratio to the nearest ten-thousandth.**

110) cos 65°

Find the measure of the indicated angle to the nearest degree.

111)
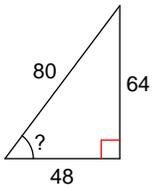

112)
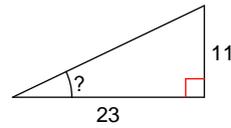
Find each angle measure to the nearest degree.

113) tan A = 0.1763

Find the missing side. Round to the nearest tenth.

114)
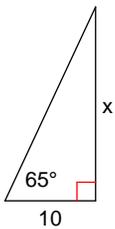
115)
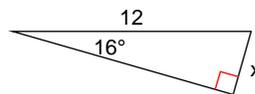
Simplify. Your answer should contain only positive exponents.

116) $3^{-3} \cdot 3^{3}$

117) 4^{4}

118) $\dfrac{3^{2}}{3^{3}}$

119) $y^{-2} \cdot 2x^{2}y^{4}$

120) $\left(b^{-1}\right)^4$

121) $\dfrac{2y^4}{3x^3 y^{-1}}$

Write each number in scientific notation.

122) 0.4

123) 0.00009

Write each number in standard notation.

124) 5×10^2

Simplify. Write each answer in scientific notation.

125) $\left(9 \times 10^3\right)\left(0.7 \times 10^{-4}\right)$

126) $\dfrac{6 \times 10^{-5}}{6.8 \times 10^1}$

127) $\left(1.15 \times 10^6\right)^{-1}$

128) $\dfrac{4.9 \times 10^4}{2.7 \times 10^{-3}}$

Solve each system by graphing.

129) $2x - y = -4$
$x - 4y = 12$
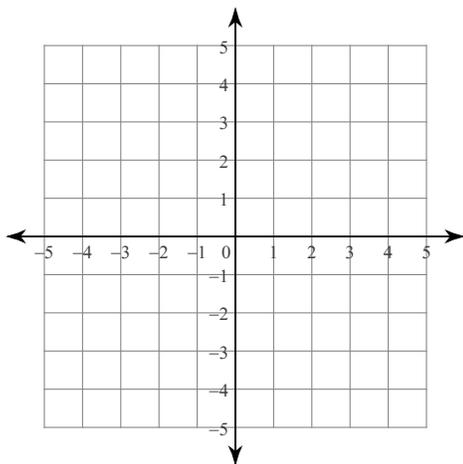
130) $y = x - 4$
$y = -3x + 4$
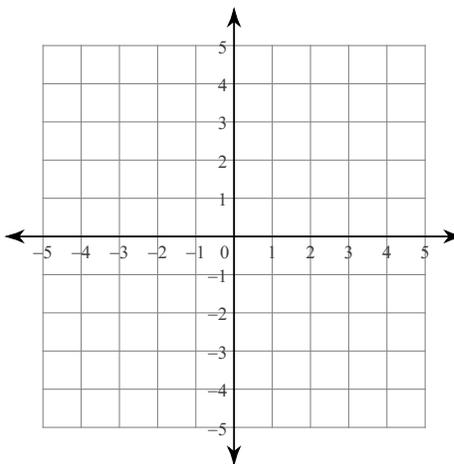
Solve each system by elimination.

131) $5x - 7y = -26$
$-5x - 6y = -13$

132) $2x - 2y = -16$
$6x - 2y = -8$

133) $-2x + 7y = -23$
$-8x + 6y = -26$

134) $8x - 5y = 0$
$-6x + 7y = 0$

Solve each system by substitution.

135) $y = -7x - 10$
$y = 5x + 2$

136) $y = 2x - 8$
$-x - 2y = -9$

137) $x + 5y = 5$
$-3x + 2y = 2$

138) $6x + 6y = -6$
$3x - 3y = 9$

Sketch the solution to each system of inequalities.

139) $2x + y < -3$
$x - y \geq -3$
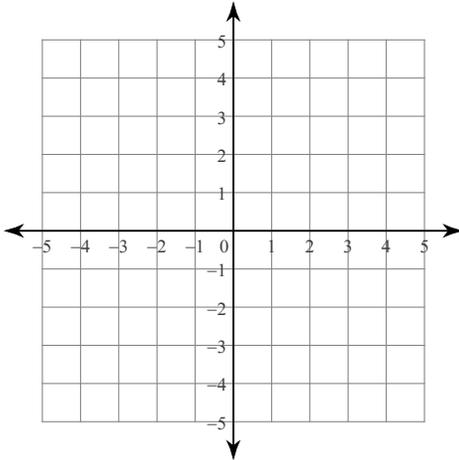
140) $y < -2x + 3$
$y \leq -\dfrac{1}{3}x - 2$
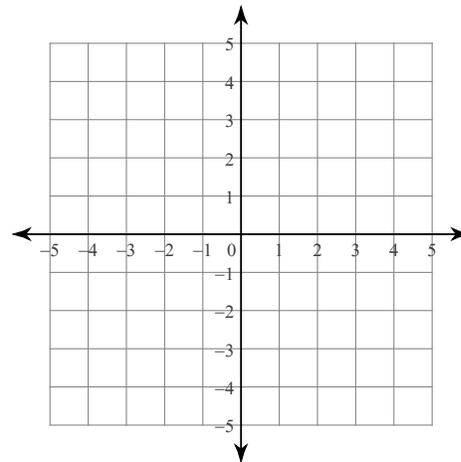
Name each polynomial by degree and number of terms.

141) $k^4 - 2k + 7$

142) 7

Factor each completely.

143) $k^2 + 4k - 32$

144) $7x^2 - 53x - 24$

145) $6x^2 + 41x + 63$

146) $16p^2 - 1$

147) $50 - 20x + 2x^2$

148) $4n^4 - 20n^2 + 25$

149) $21m^3 - 15m^2 - 7m + 5$

150) $9pc + 3pd + 15qc + 5qd$

151) $28p^2z^2 - q^2c + 7p^2c - 4q^2z^2$

Divide.

152) $(2n^3 + 20n^2 + 20n) \div 10n^3$

153) $(b^2 + b + 6) \div (b - 1)$

154) $(10v^3 - 46v^2 - 25v + 33) \div (v - 5)$

Sketch the graph of each function.

155) $y = -\dfrac{1}{2}x^2$
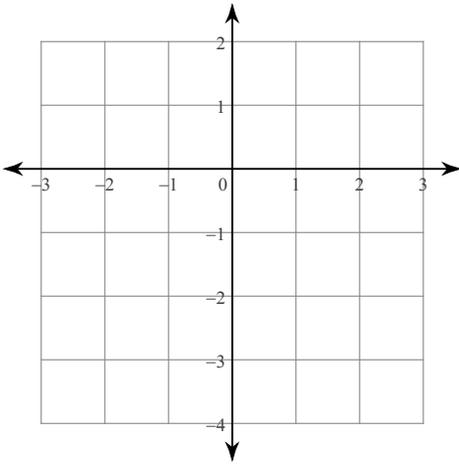

156) $y = -\dfrac{1}{2}x^2$
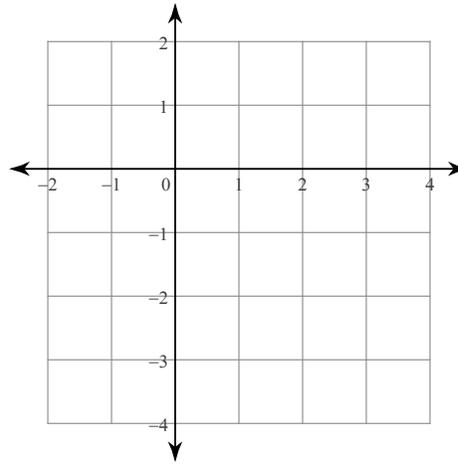
157) $-y = x^2$
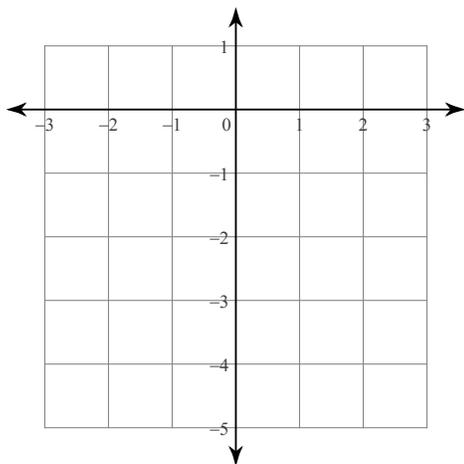
158) $y = x^2 - 6x + 11$
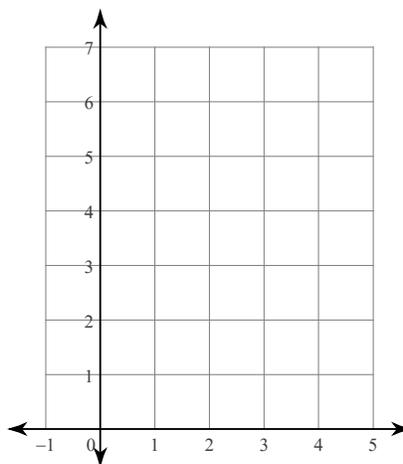
159) $y = -(x - 1)^2 - 4$
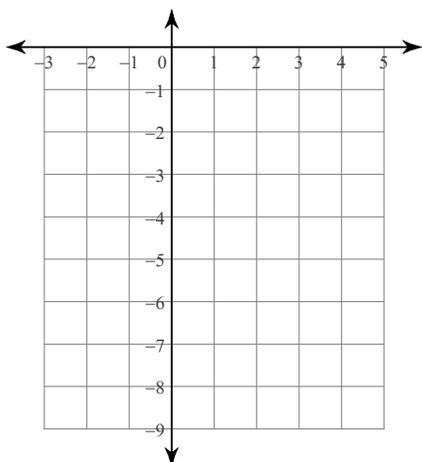
160) $-2(y + 3) = (x - 2)^2$
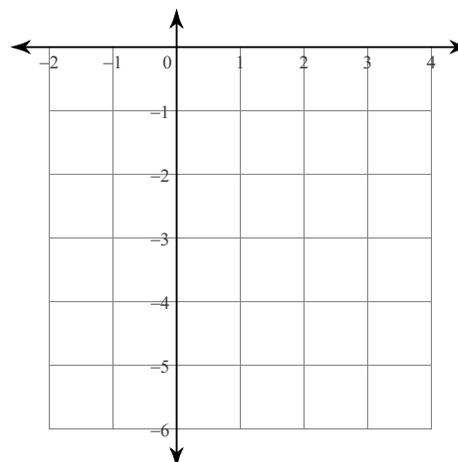
161) $y < x^2 - 4x + 3$
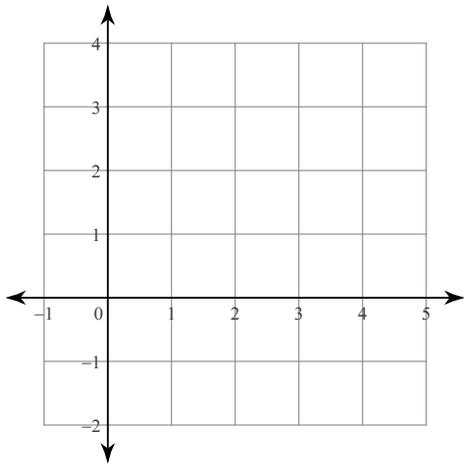
162) $y \geq -(x-2)^2 + 3$
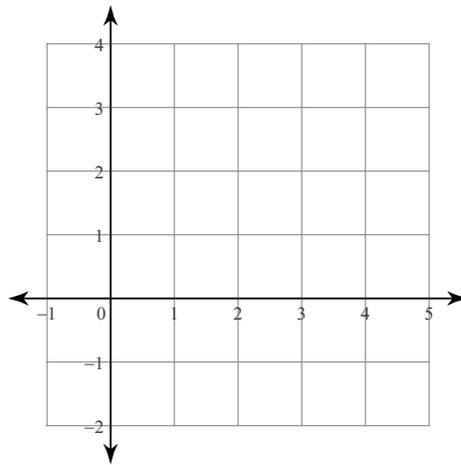
163) $-2(y-1) < (x-4)^2$
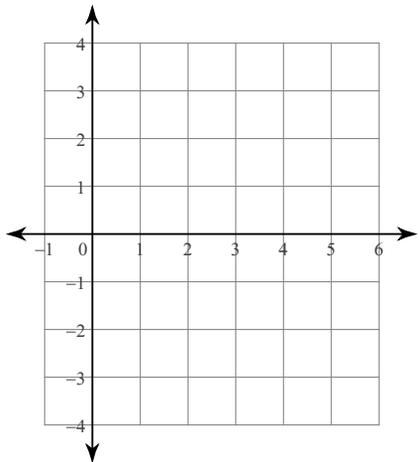
Solve each equation by completing the square.

164) $x^2 + 16x - 36 = 0$

165) $5n^2 + 10n - 65 = 10$

Solve each equation by taking square roots.

166) $b^2 = 18$

167) $5v^2 - 10 = -17$

Solve each equation by factoring.

168) $x^2 + 5x - 24 = 0$

169) $n^2 = -20 + 9n$

Solve each equation with the quadratic formula.

170) $-3a^2 - 2a - 6 = 0$

171) $5v^2 = 5 - 8v$

Simplify.

172) $\sqrt{20x^3}$

173) $\sqrt{27x^4y}$

174) $2\sqrt{6} - \sqrt{24}$

175) $3\sqrt{24} - 2\sqrt{45} - 2\sqrt{20}$

176) $-5\sqrt{3} \cdot \sqrt{3}$

177) $5\sqrt{6}\left(-2\sqrt{2} - 2\sqrt{3}\right)$

178) $\dfrac{\sqrt{15}}{\sqrt{20}}$

179) $\dfrac{-5 + \sqrt{3}}{4\sqrt{25}}$

180) $\dfrac{2}{-3 - 4\sqrt{5}}$

181) $\dfrac{-5 - 3\sqrt{2}}{5 + 4\sqrt{5}}$

Find the distance between each pair of points.

182) $(-2, -1),\ (2, 6)$

183)

-15-
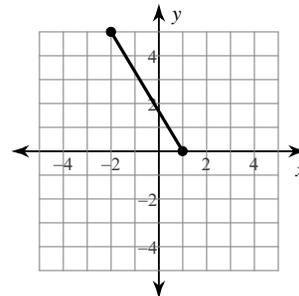
Find the midpoint of the line segment with the given endpoints.

184) $(8, -4), (-7, 8)$

Given the midpoint and one endpoint of a line segment, find the other endpoint.

185) Endpoint: $(-10, -7)$, midpoint: $(0, 5)$

Simplify each and state the excluded values.

186) $-\dfrac{49n}{35n^2}$

187) $\dfrac{18a}{45a - 36}$

188) $\dfrac{k^2 - 5k - 24}{k^2 + 2k - 80}$

189) $\dfrac{2p^2 - 6p + 4}{5p^4 - 20p^3 + 20p^2}$

190) $\dfrac{40x^2}{20x}$

191) $\dfrac{42n - 60}{12n^2}$

192) $\dfrac{9m + 36}{m^2 - 2m - 24}$

193) $\dfrac{-5r^2 + 25r - 30}{2r^3 + 8r^2 - 42r}$

Answers to Review

1) $n + 8 = 26$

2) $t - 8 = 38$

3) 8 less than n is greater than 9

4) 64

5) 15

6) 2

7) 1

8) 6

9) 13

10) 5

11) 18

12) N, W, Z, Q, R

13) -36

14) -50

15) $20n + 16$

16) $18b^2 - 9b - 35$

17) $16 - 64r^2$

18) $1 + 8x + 16x^2$

19) -8

20) 10

21) $1 + 8v$

22) $-9x + 54$

23) $21 - 10x$

24) $-22a - 40$

25) $-8a^2 + 11a + 5$

26) $12x^3 + 2x^2 - 6x$

27) $\dfrac{27}{20}$

28) $n - 4$

29) $\dfrac{8m}{m - 9}$

30) $4r$

31) $\dfrac{7x}{x + 4}$

32) $\dfrac{n - 5}{2}$

33) $\dfrac{6yx^2 + 2}{3x^2}$

34) $\dfrac{18v^2 + 6v + 2}{3v(3v + 1)}$

35) 300% increase

36) $\{-1\}$

37) $\{-14\}$

38) $\{3\}$

39) $\{-8\}$

40) $\{4\}$

41) $\{0\}$

42) $\{0\}$

43) $\{1, -1\}$

44) $\{6, -6\}$

45) $\{8, -8\}$

46) $\{5, -9\}$

47) $\{9, -17\}$

48) $\{100\}$

49) $\{36\}$

50) $\{-9\}$

51) $\{80\}$

52) $\{18\}$

53) $\{-3\}$

54) $\{1\}$

55) No solution.

56) $\{-4\}$

57) $\{-3\}$

58) $\{-2, -9\}$

59) $\left\{-3, \dfrac{2}{5}\right\}$

60) $\left\{\dfrac{27}{4}\right\}$

61) $\left\{\dfrac{50}{3}\right\}$

62) $\left\{\dfrac{37}{2}\right\}$

63) $\left\{-\dfrac{20}{9}\right\}$

64) $\{35\}$

65) $\left\{\dfrac{14}{27}\right\}$

66) 136.7 grams

67) 5 hours

68) 40%

69) Van: 8, Bus: 27

70) Van: 13, Bus: 50

71) Van: 11, Bus: 40

72) 52 km/h

73) 16%

74) ft² of grass sod: $9, pot of ivy: $7

75) 6.24 minutes

76) 8.99 hours

77)

78)

79)

80)

81) $a \le -3$

82) $x > 15$:

83) $x \ge 11$:

84) $n \le 13$:

85) $k \le -15$:

86) $p \ge 2$:

87) $x > 4$:
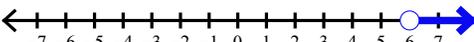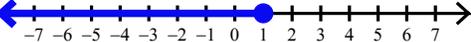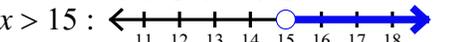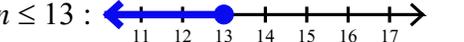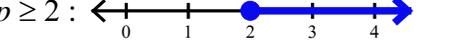
88) $-6 < n < 6$:
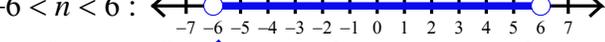
89) $m \ge 8$ or $m \le 0$:

90) $r \le -7$ or $r \ge -1$:
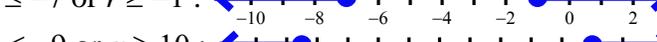
91) $x \le -9$ or $x \ge 10$:
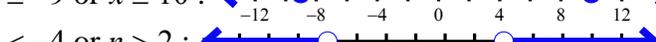
92) $n < -4$ or $n > 2$:
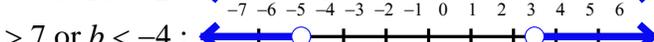
93) $b > 7$ or $b < -4$:
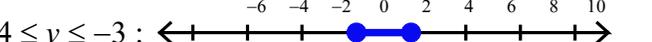
94) $-4 \le v \le -3$:
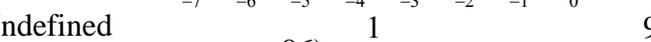
95) Undefined

96) $-\dfrac{1}{2}$

97) 2

98) $\dfrac{3}{5}$

99) -1

100) -4

101)
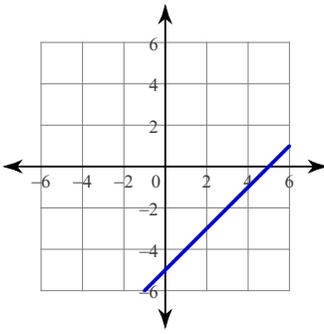

102)
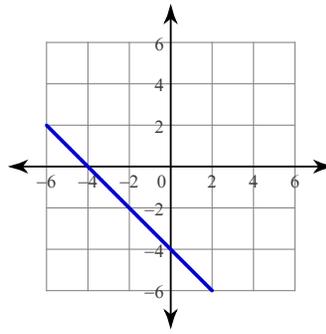
103)
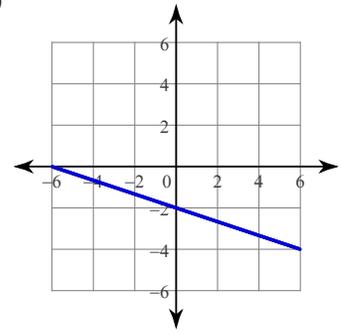
104)
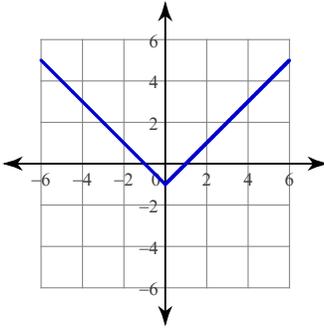
105)
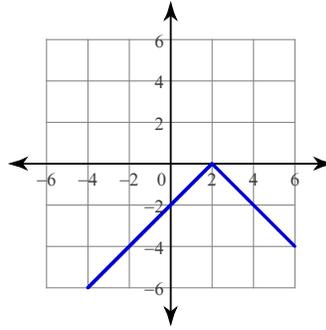
106)
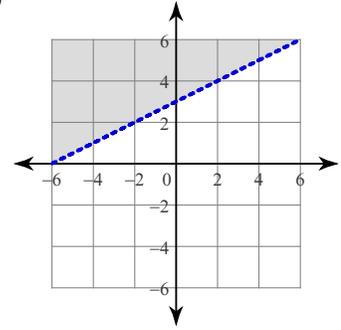
107)
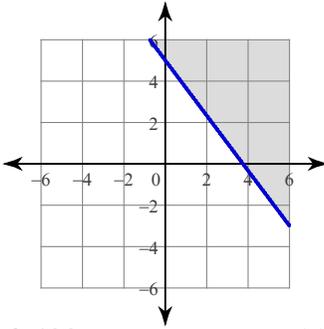
108) $\dfrac{15}{17}$

109) $\dfrac{5}{13}$

110) 0.4226

111) 53°

112) 26°

113) 10°

114) 21.4

115) 3.3

116) 1

117) 4^4

118) $\dfrac{1}{3}$

119) $2x^2y^2$

120) $\dfrac{1}{b^4}$

121) $\dfrac{2y^5}{3x^3}$

122) 4×10^{-1}

123) 9×10^{-5}

124) 500

125) 6.3×10^{-1}

126) 8.824×10^{-7}

127) 8.696×10^{-7}

128) 1.815×10^7

129) $(-4, -4)$

130) $(2, -2)$

131) $(-1, 3)$

132) $(2, 10)$

133) $(1, -3)$

134) $(0, 0)$

135) $(-1, -3)$

136) $(5, 2)$

137) $(0, 1)$

138) $(1, -2)$

139)

140)
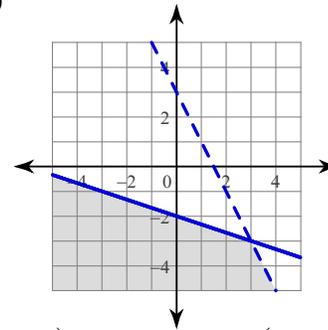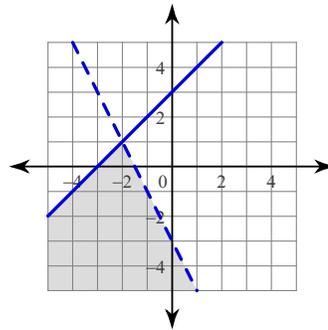
141) quartic trinomial

142) constant monomial

143) $(k - 4)(k + 8)$

144) $(7x + 3)(x - 8)$

145) $(3x + 7)(2x + 9)$

146) $(4p + 1)(4p - 1)$

147) $2(5 - x)^2$

148) $(2n^2 - 5)^2$

149) $(3m^2 - 1)(7m - 5)$

150) $(3p + 5q)(3c + d)$

151) $(7p^2 - q^2)(4z^2 + c)$

152) $\dfrac{1}{5} + \dfrac{2}{n} + \dfrac{2}{n^2}$

153) $b + 2 + \dfrac{8}{b - 1}$

154) $10v^2 + 4v - 5 + \dfrac{8}{v - 5}$

155)
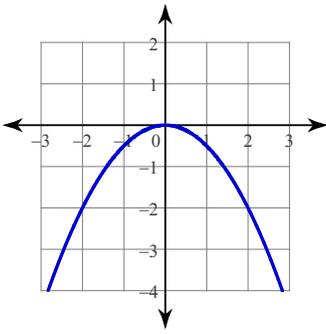
156)
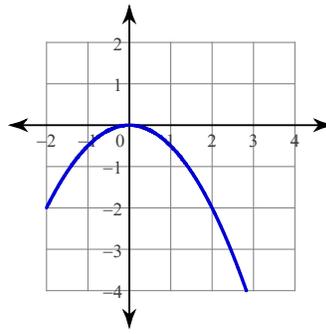
157)
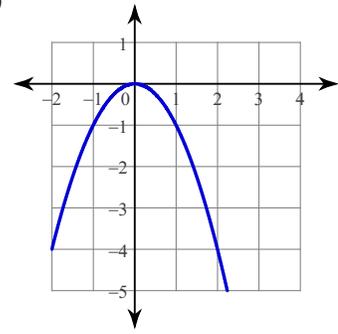

158)
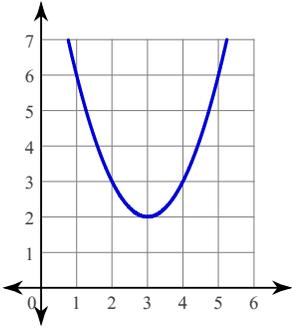
159)
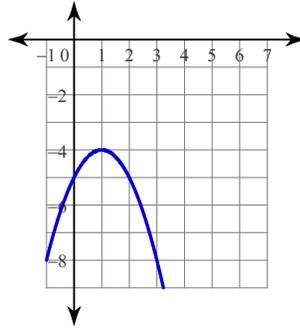
160)
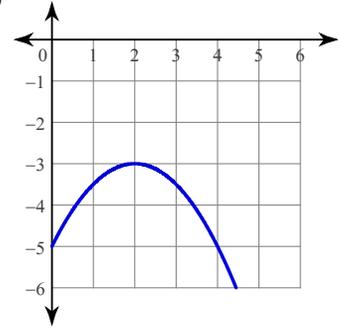
161)
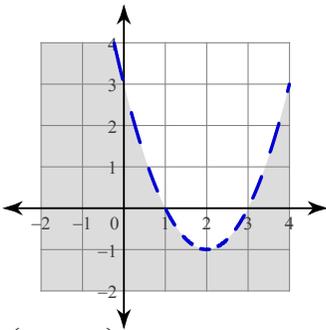
162)
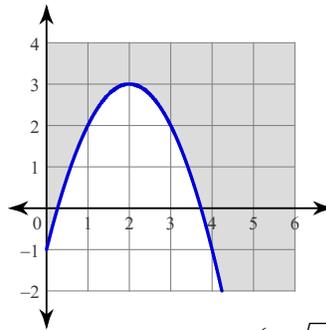
163)
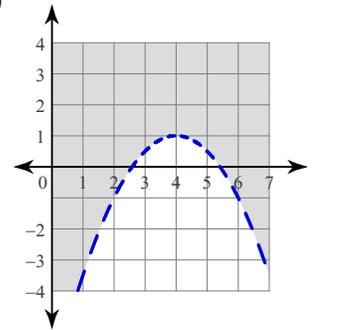
164) $\{2, -18\}$

165) $\{3, -5\}$

166) $\{3\sqrt{2}, -3\sqrt{2}\}$

167) No solution.

168) $\{-8, 3\}$

169) $\{5, 4\}$

170) No solution.

171) $\left\{\dfrac{-4+\sqrt{41}}{5}, \dfrac{-4-\sqrt{41}}{5}\right\}$

172) $2x\sqrt{5x}$

173) $3x^2\sqrt{3y}$

174) 0

175) $6\sqrt{6} - 10\sqrt{5}$

176) -15

177) $-20\sqrt{3} - 30\sqrt{2}$

178) $\dfrac{\sqrt{3}}{2}$

179) $\dfrac{-5+\sqrt{3}}{20}$

180) $\dfrac{6 - 8\sqrt{5}}{71}$

181) $\dfrac{25 - 20\sqrt{5} + 15\sqrt{2} - 12\sqrt{10}}{55}$

182) $\sqrt{65}$

183) $\sqrt{34}$

184) $\left(\dfrac{1}{2}, 2\right)$

185) $(10, 17)$

186) $-\dfrac{7}{5n}$; $\{0\}$

187) $\dfrac{2a}{5a - 4}$; $\left\{\dfrac{4}{5}\right\}$

188) $\dfrac{k+3}{k+10}$; $\{-10, 8\}$

189) $\dfrac{2(p-1)}{5p^2(p-2)}$; $\{0, 2\}$

190) $2x$; $\{0\}$

191) $\dfrac{7n - 10}{2n^2}$; $\{0\}$

192) $\dfrac{9}{m-6}$; $\{-4, 6\}$

193) $\dfrac{5(-r+2)}{2r(r+7)}$; $\{0, -7, 3\}$