

Review

Write each as an algebraic expression.

1) the product of a number and 10 is less than or equal to 42

2) n divided by 8 is 6

Write each as a verbal expression.

3) $n^3 = 30$

Evaluate each expression.

4) the product of 5 and 8

5) $(4 - 3 + 1) \div 2$

6) $\frac{2 + 1 + 2}{5}$

7) $(-7) + 3$

8) $(-4) + 8 - 4$

9) $(-1) + (-5) - 3 - 2$

Evaluate each using the values given.

10) $p + n - (n - n)$; use $n = 5$, and $p = 6$

11) $\frac{x^2y}{5}$; use $x = 5$, and $y = 5$

Name the set or sets to which each number belongs.

12) $\sqrt{78}$

Find each product.

13) $(-3)(5)$

14) $(2)(-7)(-1)$

15) $2(5m + 3)$

16) $(6r - 8)(3r - 1)$

17) $(8x - 3)(8x + 3)$

18) $(2n + 2)^2$

Find each quotient.

19) $\frac{-6}{-2}$

20) $-30 \div -3$

Simplify each expression.

21) $1 + 9x + x + 3$

22) $5(10n + 6)$

23) $6(1 + 6a) + 10a$

24) $8(k + 9) + 6(k + 9)$

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

26) $(4r^3 - 2r^2 - 3r) - (8r^2 - 8 + 8r^3)$

27) $\frac{9}{2n} \cdot \frac{9n}{4n}$

28) $\frac{m - 2}{m - 1} \cdot \frac{(m + 7)(m - 1)}{(m - 10)(m - 2)}$

29) $\frac{10}{18r^2 + 36r} \cdot \frac{14r + 28}{10}$

30) $\frac{4x}{6} \div \frac{7}{8}$

31) $\frac{(2 - n)(n - 5)}{n - 5} \div \frac{(n - 5)(n - 2)}{n - 9}$

32) $\frac{b + 3}{b^2 + 13b + 30} \div \frac{1}{6b + 24}$

33) $\frac{3m}{5n} - \frac{6m}{6n}$

34) $\frac{2x}{2} + \frac{x + 5}{12x - 15}$

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

35) From \$55.40 to \$29

Solve each equation.

36) $-6a = -90$

37) $28 = 14k$

38) $\frac{6 + x}{8} = 3$

39) $-1 = \frac{8 + x}{10}$

40) $-6(8n - 6) - 3n = -66$

41) $-(k - 1) = -26 + 8k$

42) $4(p - 6) = 3(1 - p) - 2p$

43) $|x| = 3$

44) $|n + 6| = 9$

45) $|8m| + 8 = 88$

46) $-8 + |-10r - 3| = 79$

47) $3|10x - 4| - 7 = 101$

Solve each equation. Remember to check for extraneous solutions.

48) $2 = \sqrt{n - 4}$

49) $10 = \sqrt{\frac{b}{8}}$

50) $\frac{4}{v^2} = \frac{3}{v} + \frac{1}{v^2}$

51) $-8 + \sqrt{x} = -7$

52) $-18 = -2\sqrt{\frac{x}{4}}$

53) $\sqrt{6a + 8} = \sqrt{8 - a}$

54) $k = \sqrt{-80 + 18k}$

55) $\sqrt{7p - 5} - p = 1$

56) $\frac{4x + 8}{x} = \frac{1}{5x} + 1$

57) $\frac{6}{n^2 - 4n} + \frac{1}{n - 4} = \frac{1}{n^2 - 4n}$

58) $\frac{1}{m} + \frac{3m^2 - 3}{m^2} = \frac{1}{m^2}$

59) $\frac{r^2 - 5r + 6}{r^2 + 6r} - \frac{1}{r^2 + 6r} = \frac{1}{r + 6}$

Solve each proportion.

60) $\frac{5}{2} = \frac{x}{8}$

61) $\frac{2}{n} = \frac{9}{3}$

62) $\frac{9}{7} = -\frac{8}{b + 8}$

63) $-\frac{v}{v - 6} = \frac{2}{4}$

64) $\frac{x - 7}{x + 7} = -\frac{6}{9}$

65) $\frac{6}{2} = \frac{3n - 3}{7n - 3}$

Solve each problem.

66) \$42 is 86% of what?

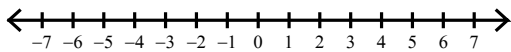
- 67) Stephanie left Jessica's house and drove toward the lake at an average speed of 32 km/h. Danielle left some time later driving in the same direction at an average speed of 40 km/h. After driving for four hours Danielle caught up with Stephanie. Find the number of hours Stephanie drove before Danielle caught up.
- 68) A metal alloy weighing 10 lb. and containing 56% gold is melted and mixed with 12 lb. of pure gold. What percent of the resulting alloy is gold?
- 69) Eduardo's school is selling tickets to a play. On the first day of ticket sales the school sold 13 adult tickets and 14 child tickets for a total of \$392. The school took in \$242 on the second day by selling 13 adult tickets and 4 child tickets. What is the price each of one adult ticket and one child ticket?
- 70) Elisa's school is selling tickets to a choral performance. On the first day of ticket sales the school sold 4 adult tickets and 11 child tickets for a total of \$89. The school took in \$41 on the second day by selling 2 adult tickets and 5 child tickets. What is the price each of one adult ticket and one child ticket?
- 71) Trevon and Totsakan each improved their yards by planting rose bushes and shrubs. They bought their supplies from the same store. Trevon spent \$98 on 4 rose bushes and 6 shrubs. Totsakan spent \$201 on 10 rose bushes and 11 shrubs. What is the cost of one rose bush and the cost of one shrub?
- 72) An aircraft carrier left the Dania Pier and traveled toward a navigational buoy at an average speed of 10 mph. Some time later a fishing boat left traveling in the same direction but at an average speed of 15 mph. After traveling for two hours the fishing boat caught up with the aircraft carrier. Find the number of hours the aircraft carrier traveled before the fishing boat caught up.
- 73) Molly wants to make a 46% acid solution. She has already poured 12 L of a 70% acid solution into a beaker. How many L of a 10% acid solution must she add to this to create the desired mixture?
- 74) The senior classes at High School A and High School B planned separate trips to the county fair. The senior class at High School A rented and filled 10 vans and 14 buses with 548 students. High School B rented and filled 5 vans and 6 buses with 247 students. Every van had the same number of students in it as did the buses. How many students can a van carry? How many students can a bus carry?

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

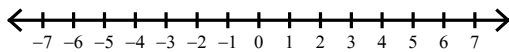
- 75) It takes Jennifer 12 hours to mop a warehouse. Jill can mop the same warehouse in 9 hours. If they worked together how long would it take them?
- 76) Working together, Maria and Ryan can dig a 10 ft by 10 ft hole in 4.74 hours. Had he done it alone it would have taken Ryan ten hours. Find how long it would take Maria to do it alone.

Draw a graph for each inequality.

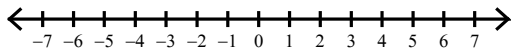
77) $n \geq -1$



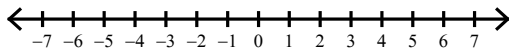
78) $2 \geq n$



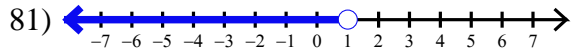
79) $-r \geq 6$



80) $-4 < -r$

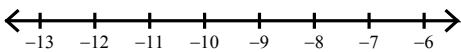


Write an inequality for each graph.

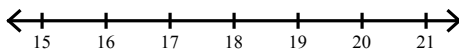


Solve each inequality and graph its solution.

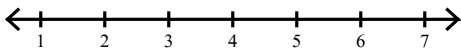
82) $x - 4 > -14$



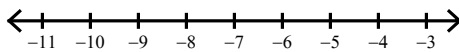
83) $a - -17 > 35$



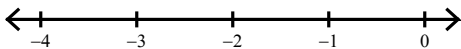
84) $9(2 + k) > 54$



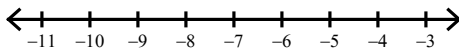
85) $\frac{p}{2} + 9 < 5$



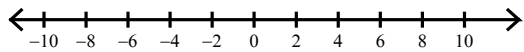
86) $7(2 - 4x) \leq 70$



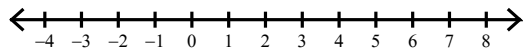
87) $8n - 20 \leq 4(4n - 2) - 6n$



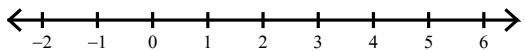
88) $|m| \leq 9$



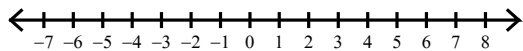
89) $|-2 + r| \leq 4$



90) $|-7x + 8| < 15$

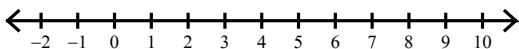


91) $|-3 + 8n| + 3 < 40$

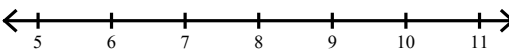


Solve each compound inequality and graph its solution.

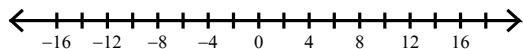
92) $-48 < -6b < -6$



93) $7 - 8v > -57$ or $1 + 9v < -53$

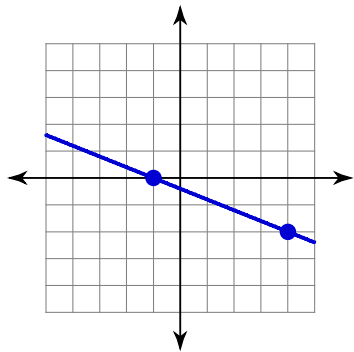


94) $3x - 10 \geq 4x + 3$ or $2x - 5 \geq x + 10$



Find the slope of each line.

95)



96) $y = -\frac{4}{5}x + 1$

97) $x + y = 2$

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

98) $(-13, -20), (14, 14)$

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

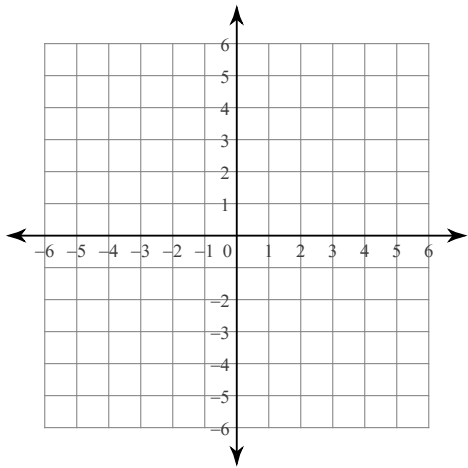
99) $y = -\frac{2}{3}x + 3$

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

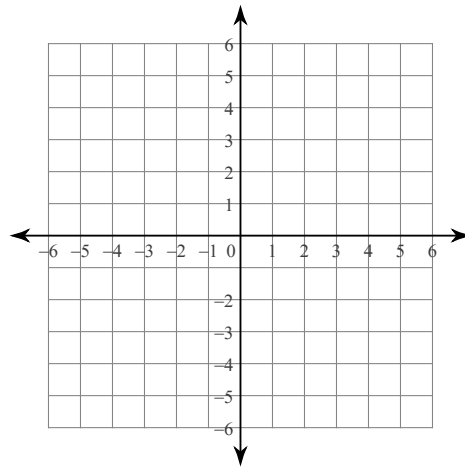
100) $y = -\frac{2}{5}x + 3$

Sketch the graph of each line.

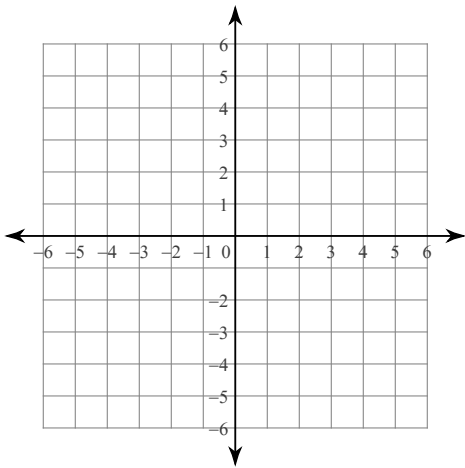
101) x -intercept = 4, y -intercept = -3



102) $x - 2y = -6$

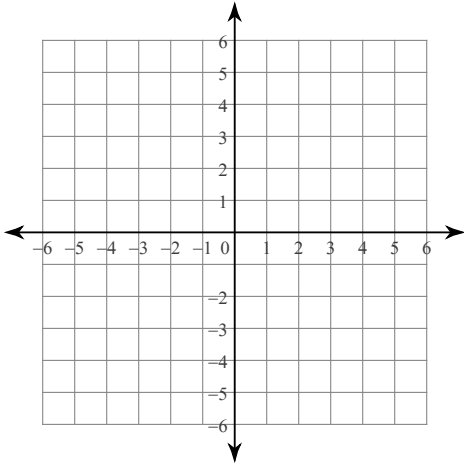


103) $y = -9x + 4$

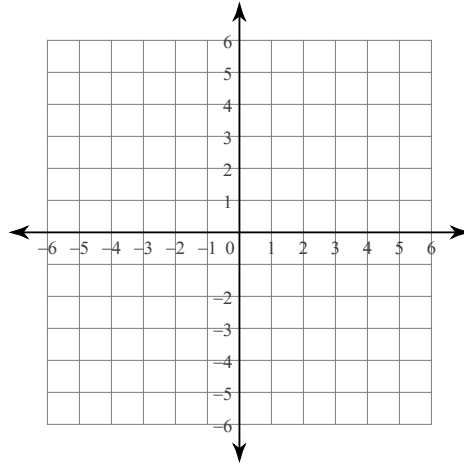


Graph each equation.

104) $y = |x - 3| - 1$

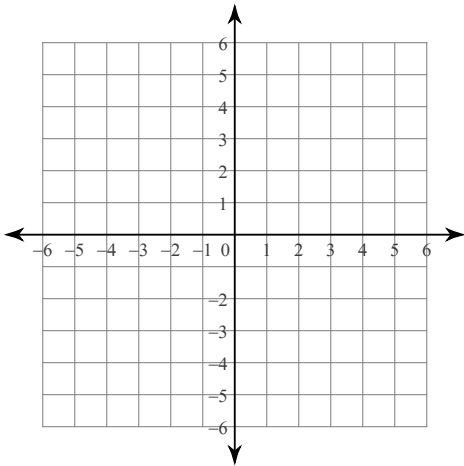


105) $y = -|x - 3| + 2$

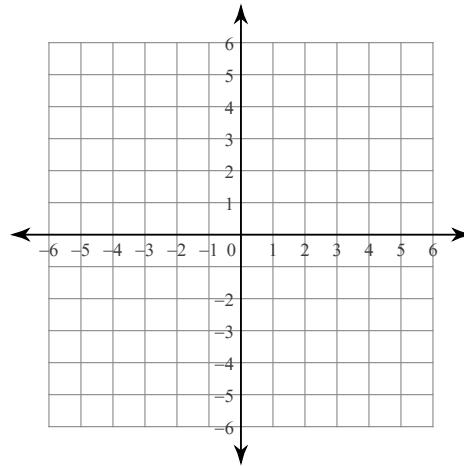


Sketch the graph of each linear inequality.

106) $y > x - 2$

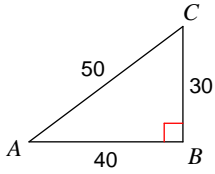


107) $3x - 5y > 0$

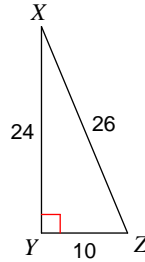


Find the value of each trigonometric ratio.

108) $\cos A$



109) $\tan Z$

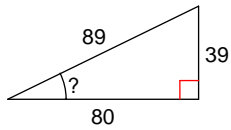


Find the value of each trigonometric ratio to the nearest ten-thousandth.

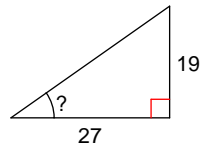
110) $\tan 10^\circ$

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

111)



112)

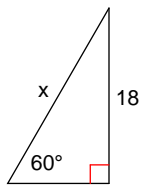


Find each angle measure to the nearest degree.

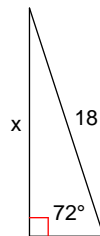
113) $\sin W = 0.8290$

Find the missing side. Round to the nearest tenth.

114)



115)



Simplify. Your answer should contain only positive exponents.

116) $4^3 \cdot 4^2$

117) $(2^4)^3$

118) $\frac{4}{4^3}$

119) $4a^{-3} \cdot 4b^{-3}$

120) $(x^{-4}y^2)^3$

121) $\frac{4a^2}{2a^{-3}b^{-1}}$

Write each number in scientific notation.

122) 6800

123) 0.819

Write each number in standard notation.

124) 9.1×10^{-4}

Simplify. Write each answer in scientific notation.

125) $(1.84 \times 10^3)(4.91 \times 10^{-5})$

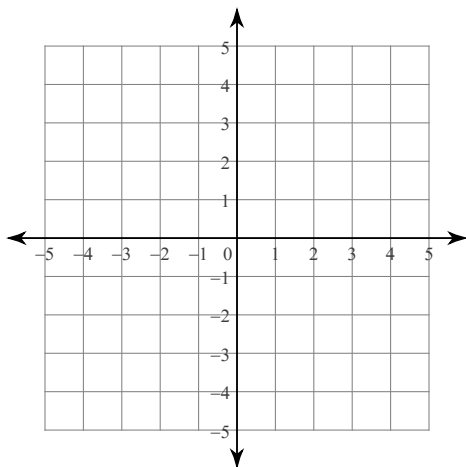
126) $\frac{96.7 \times 10^6}{9.2 \times 10^3}$

127) $(7.4 \times 10^2)^4$

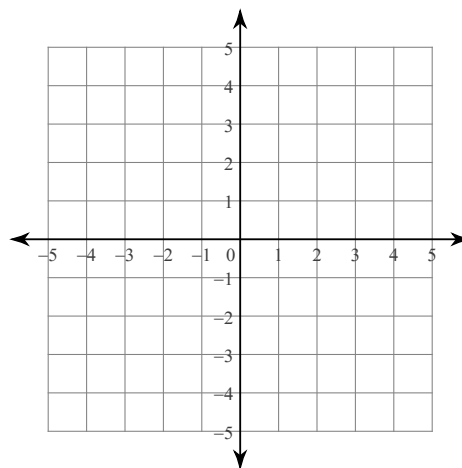
128) $\frac{8.26 \times 10^{-1}}{5 \times 10^6}$

Solve each system by graphing.

129) $x - y = 3$
 $6x - y = -2$



130) $y = -\frac{7}{2}x - 4$
 $y = -\frac{1}{2}x + 2$



Solve each system by elimination.

131) $-10x - 2y = 24$
 $-6x + 2y = 8$

132) $-4x + 7y = -21$
 $-4x + 6y = -14$

$$133) \begin{cases} x + 2y = 3 \\ 10x + 10y = 20 \end{cases}$$

$$134) \begin{cases} 9x + 2y = 26 \\ -2x - 7y = 27 \end{cases}$$

Solve each system by substitution.

$$135) \begin{cases} y = -3x - 16 \\ y = -2x - 8 \end{cases}$$

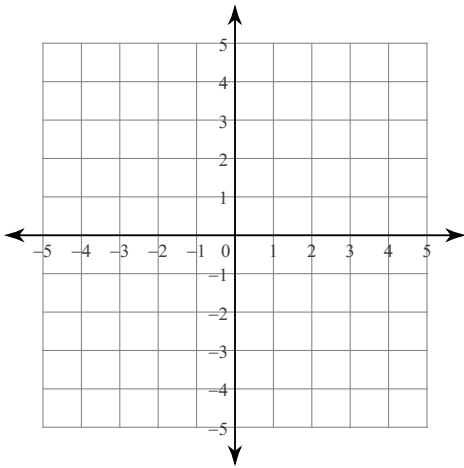
$$136) \begin{cases} 8x - 7y = 10 \\ y = -7x + 23 \end{cases}$$

$$137) \begin{cases} x + 8y = -4 \\ -4x + 2y = -18 \end{cases}$$

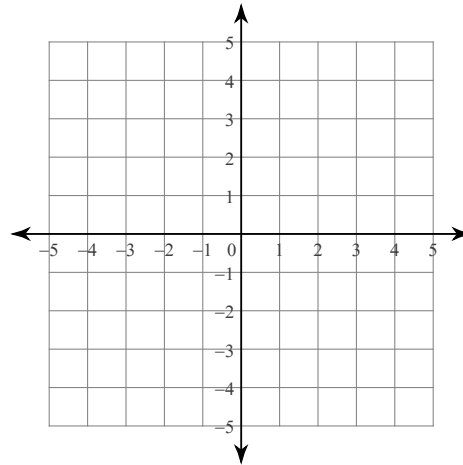
$$138) \begin{cases} 6x + 2y = 0 \\ -8x - y = 10 \end{cases}$$

Sketch the solution to each system of inequalities.

$$139) \begin{cases} y > -2 \\ x + y \leq 1 \end{cases}$$



$$140) \begin{cases} y \geq -\frac{1}{3}x + 2 \\ y \leq x - 2 \end{cases}$$



Name each polynomial by degree and number of terms.

$$141) -1$$

$$142) 10n^3 - n^2$$

Factor each completely.

$$143) m^2 - 5m - 36$$

$$144) 9x^2 + 21x$$

$$145) 9n^2 + 30n$$

$$146) 2 - 2x^2$$

147) $25 + 20n + 4n^2$

148) $48m^4 - 120m^2 + 75$

149) $30r^3 - 6r^2 + 70r - 14$

150) $50xy + 70x + 70y^2 + 98y$

151) $42au^2 + 15yv^2 - 105av^2 - 6yu^2$

Divide.

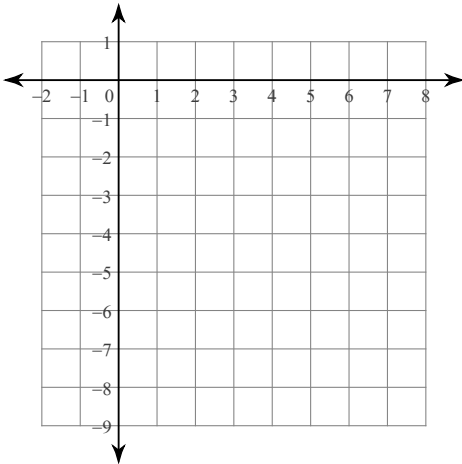
152) $(2b^3 + 3b^2 + 24b) \div 6$

153) $(v^2 + 12v + 36) \div (v + 8)$

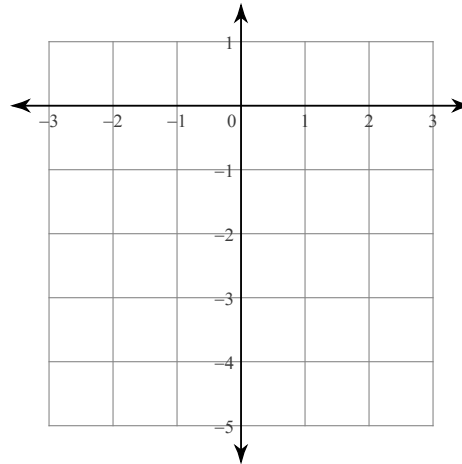
154) $(x^3 - 2x^2 - 25x - 14) \div (x + 4)$

Sketch the graph of each function.

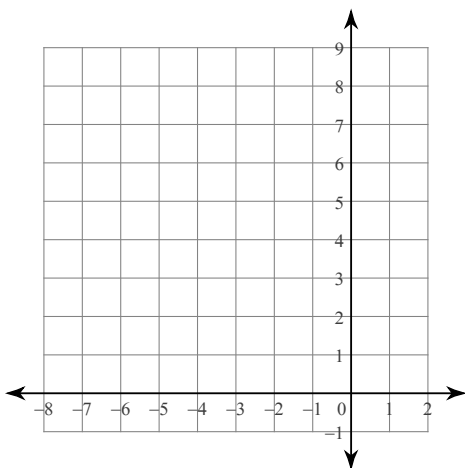
155) $y = -2x^2$



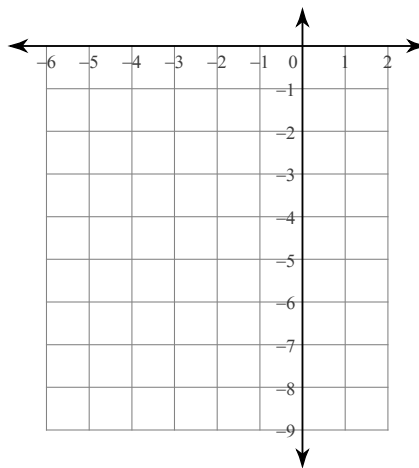
156) $y = -x^2$



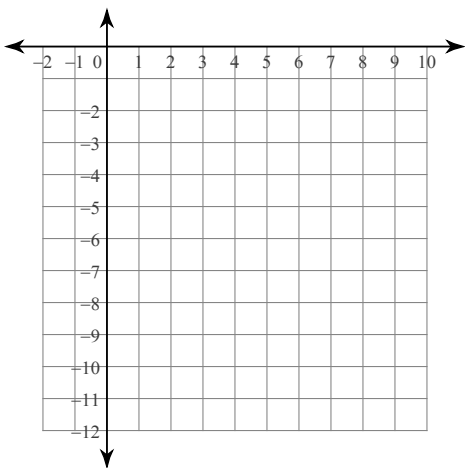
$$157) \frac{1}{2}y = x^2$$



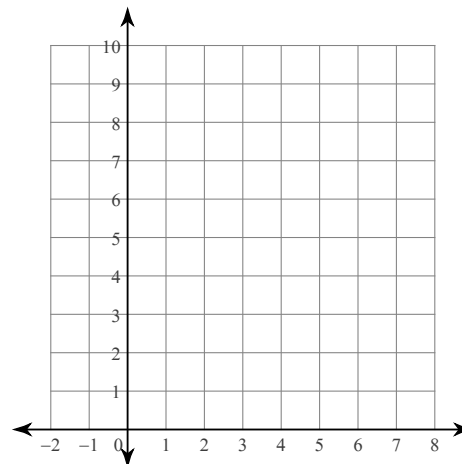
$$158) y = -x^2 - 2x - 5$$



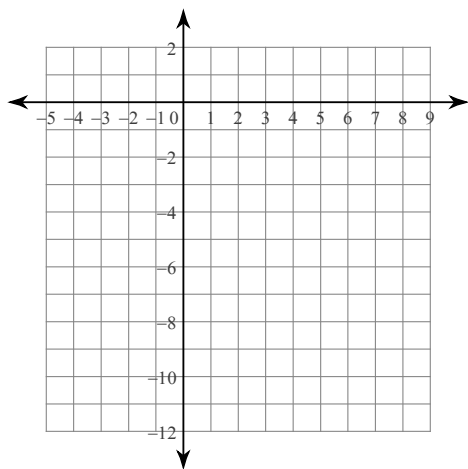
$$159) y = -2(x - 1)^2 - 3$$



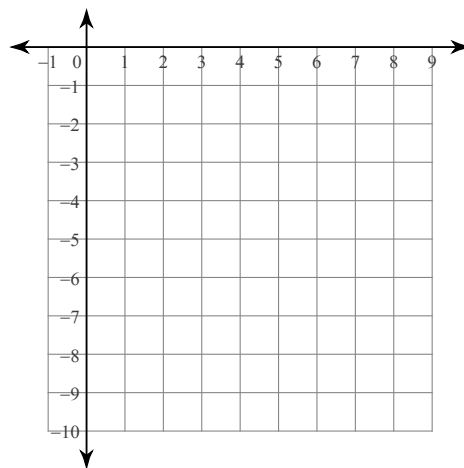
$$160) \frac{1}{2}(y - 1) = (x - 1)^2$$



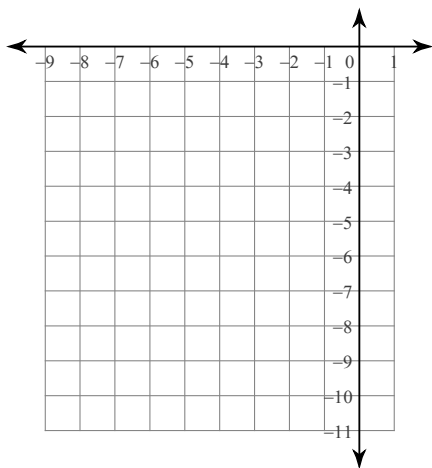
$$161) y \leq -3x^2 + 12x - 11$$



$$162) y \leq -2(x - 3)^2 - 1$$



$$163) -\frac{1}{2}(y + 2) > (x + 1)^2$$



Solve each equation by completing the square.

$$164) n^2 - 4n + 44 = 0$$

$$165) 4b^2 - 16b - 27 = 6$$

Solve each equation by taking square roots.

166) $r^2 = 81$

167) $4x^2 + 5 = 9$

Solve each equation by factoring.

168) $n^2 - n - 56 = 0$

169) $b^2 + 10b = -16$

Solve each equation with the quadratic formula.

170) $5v^2 + 4v - 96 = 0$

171) $2x^2 = 70 - 4x$

Simplify.

172) $\sqrt{343x^3}$

173) $\sqrt{196x^3y^2}$

174) $3\sqrt{20} - 2\sqrt{5}$

175) $-2\sqrt{27} - 2\sqrt{2} + 3\sqrt{3}$

176) $3\sqrt{10} \cdot \sqrt{15}$

177) $\sqrt{5}(-\sqrt{2} - 4\sqrt{5})$

178) $\frac{2\sqrt{12}}{2\sqrt{16}}$

179) $\frac{5 - \sqrt{2}}{\sqrt{4}}$

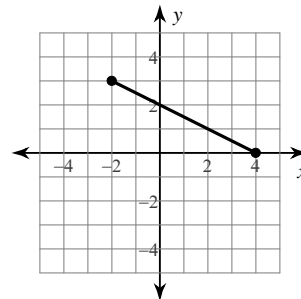
180) $\frac{2}{2 - \sqrt{3}}$

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

Find the distance between each pair of points.

182) $(3, 6), (-5, -8)$

183)



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

184) $(-9, 5), (5, 10)$

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

185) Endpoint: $(-6, 2)$, midpoint: $(-10, -1)$

Simplify each and state the excluded values.

186) $\frac{8a}{14a^3}$

187) $\frac{k+10}{3k+30}$

188) $\frac{25x-30}{25x-25}$

189) $\frac{8x^4 + 96x^3 + 160x^2}{4x^4 + 36x^3 - 40x^2}$

190) $\frac{28n}{20n^5}$

191) $\frac{m^2 + 10m + 9}{m + 9}$

192) $\frac{p^2 - p - 6}{4p + 8}$

193) $\frac{18x^2 + 90x + 72}{18x + 63}$

Answers to Review

1) $n \cdot 10 \leq 42$

2) $\frac{n}{8} = 6$

3) n cubed is equal to 30 4) 40

5) 1

6) 1

7) -4

8) 0

9) -11

10) 11

11) 25

12) I, R

13) -15

14) 14

15) $10m + 6$

16) $18r^2 - 30r + 8$

17) $64x^2 - 9$

18) $4n^2 + 8n + 4$

19) 3

20) 10

21) $4 + 10x$

22) $50n + 30$

23) $6 + 46a$

24) $14k + 126$

25) $-2x^2 + 11x - 5$

26) $-4r^3 - 10r^2 - 3r + 8$

27) $\frac{81}{8n}$

28) $\frac{m+7}{m-10}$

29) $\frac{7}{9r}$

30) $\frac{16x}{21}$

31) $-\frac{(n-9)}{n-5}$

32) $\frac{6(b+4)}{b+10}$

33) $-\frac{2m}{5n}$

34) $\frac{12x^2 - 14x + 5}{3(4x-5)}$

35) 47.7% decrease

36) {15}

37) {2}

38) {18}

39) {-18}

40) {2}

41) {3}

42) {3}

43) {3, -3}

44) {3, -15}

45) {10, -10}

46) $\left\{-9, \frac{42}{5}\right\}$

47) $\left\{4, -\frac{16}{5}\right\}$

48) {8}

49) {800}

50) {1}

51) {1}

52) {324}

53) {0}

54) {8, 10}

55) {2, 3}

56) $\left\{-\frac{13}{5}\right\}$

57) {-5}

58) $\left\{-\frac{4}{3}, 1\right\}$

59) {1, 5}

60) {20}

61) $\left\{\frac{2}{3}\right\}$

62) $\left\{-\frac{128}{9}\right\}$

63) {2}

64) $\left\{\frac{7}{5}\right\}$

65) $\left\{\frac{1}{3}\right\}$

66) \$48.84

67) 5 hours

68) 80%

69) adult ticket: \$14, child ticket: \$15

70) adult ticket: \$3, child ticket: \$7 71) rose bush: \$8, shrub: \$11

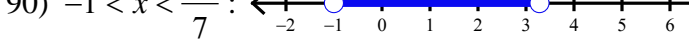
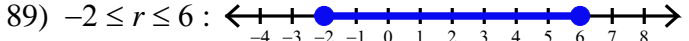
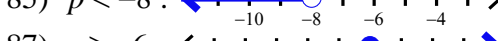
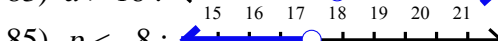
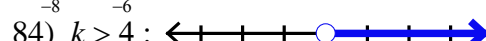
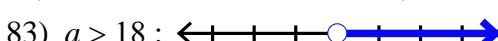
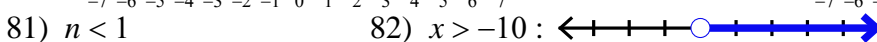
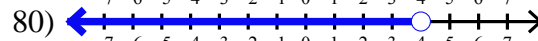
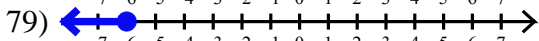
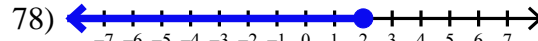
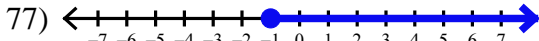
72) 3 hours

73) 8 L

74) Van: 17, Bus: 27

75) 5.14 hours

76) 9.01 hours



95) $-\frac{2}{5}$

96) $-\frac{4}{5}$

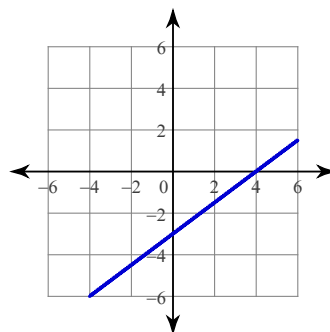
97) -1

98) $\frac{34}{27}$

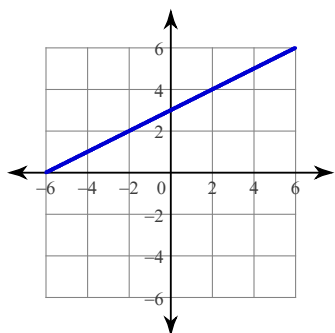
99) $-\frac{2}{3}$

100) $\frac{5}{2}$

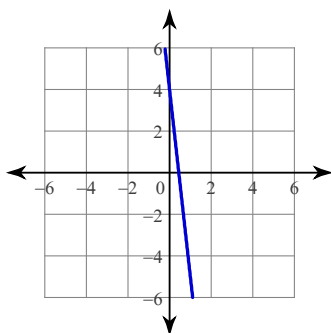
101)



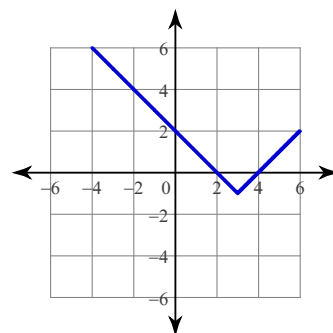
102)



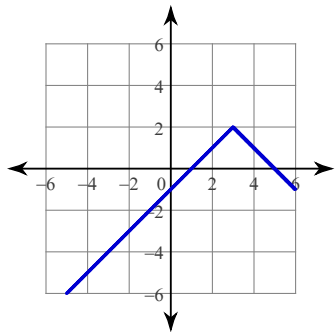
103)



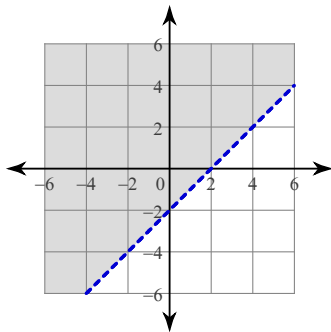
104)



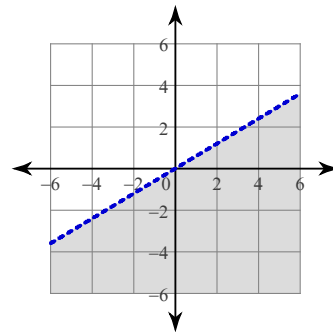
105)



106)



107)



108) $\frac{4}{5}$

109) $\frac{12}{5}$

110) 0.1763

111) 26°

112) 35°

113) 56°

114) 20.8

115) 17.1

116) 4^5

117) 2^{12}

118) $\frac{1}{4^2}$

119) $\frac{16}{a^3b^3}$

120) $\frac{y^6}{x^{12}}$

121) $2a^5b$

122) 6.8×10^3

123) 8.19×10^{-1}

124) 0.00091

125) 9.034×10^{-2}

126) 1.051×10^4

127) 2.999×10^{11}

128) 1.652×10^{-7}

129) $(-1, -4)$

130) $(-2, 3)$

131) $(-2, -2)$

132) $(-7, -7)$

133) $(1, 1)$

134) $(4, -5)$

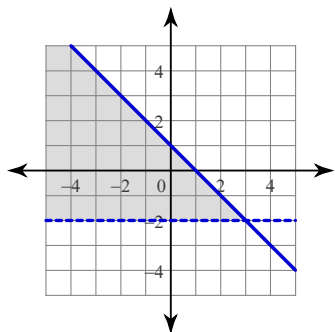
135) $(-8, 8)$

136) $(3, 2)$

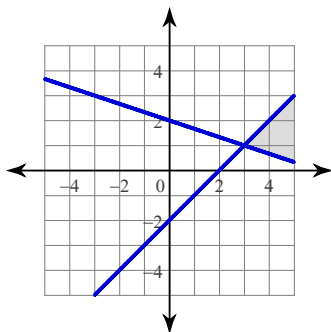
137) $(4, -1)$

138) $(-2, 6)$

139)



140)



141) constant monomial

142) cubic binomial

143) $(m+4)(m-9)$

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

145) $3n(3n+10)$

146) $2(1+x)(1-x)$

147) $(5+2n)^2$

148) $3(4m^2-5)^2$

149) $2(3r^2+7)(5r-1)$

150) $2(5x+7y)(5y+7)$

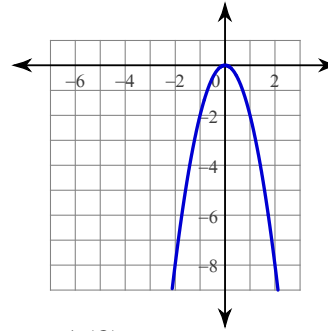
151) $3(7a-y)(2u^2-5v^2)$

152) $\frac{b^3}{3} + \frac{b^2}{2} + 4b$

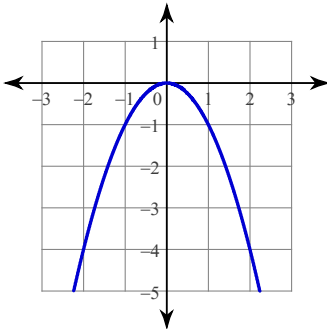
153) $v + 4 + \frac{4}{v+8}$

154) $x^2 - 6x - 1 - \frac{10}{x+4}$

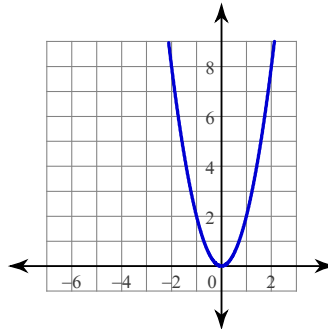
155)



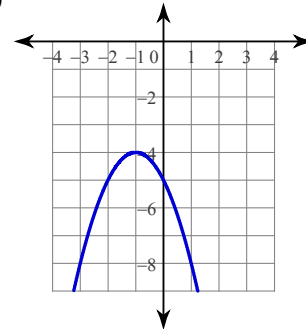
156)



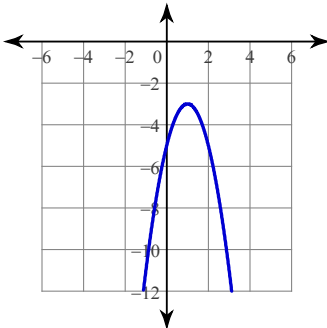
157)



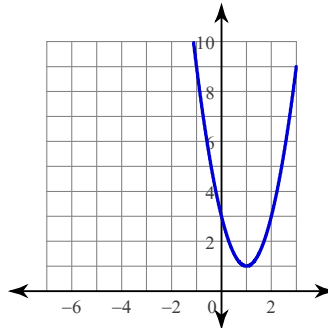
158)



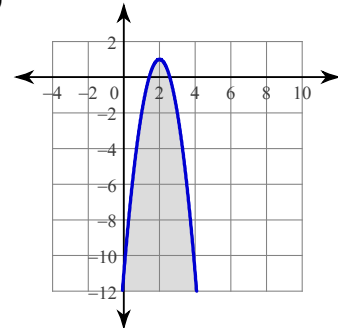
159)



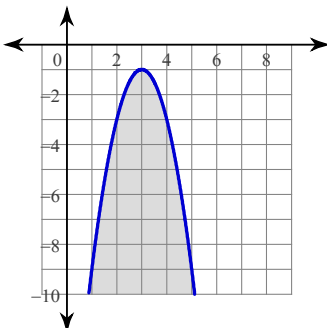
160)



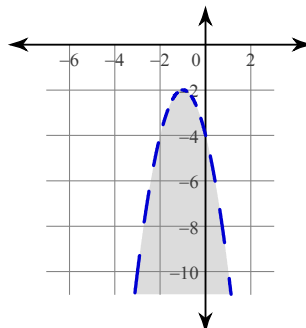
161)



162)



163)



164) No solution.

165) $\left\{5\frac{1}{2}, -1\frac{1}{2}\right\}$

166) $\{9, -9\}$

167) $\{1, -1\}$

168) $\{-7, 8\}$

169) $\{-2, -8\}$

170) $\left\{4, -4\frac{4}{5}\right\}$

171) $\{5, -7\}$

172) $7x\sqrt{7x}$

173) $14xy\sqrt{x}$

174) $4\sqrt{5}$

175) $-3\sqrt{3} - 2\sqrt{2}$

176) $15\sqrt{6}$

177) $-\sqrt{10} - 20$

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

179) $\frac{5-\sqrt{2}}{2}$

180) $4 + 2\sqrt{3}$

181) $\frac{8 - 2\sqrt{2} - 8\sqrt{3} + 2\sqrt{6}}{7}$

182) $2\sqrt{65}$

183) $3\sqrt{5}$

184) $\left(-2, 7\frac{1}{2}\right)$

185) $(-14, -4)$

186) $\frac{4}{7a^2}; \{0\}$

187) $\frac{1}{3}; \{-10\}$

188) $\frac{5x-6}{5(x-1)}; \{1\}$

189) $\frac{2(x+2)}{x-1}; \{0, -10, 1\}$

190) $\frac{7}{5n^4}; \{0\}$

191) $m+1; \{-9\}$

192) $\frac{p-3}{4}; \{-2\}$

193) $\frac{2(x+1)(x+4)}{2x+7}; \left\{-\frac{7}{2}\right\}$