Summer Review For Students Entering Algebra 1 at CRMS

Colorado Rocky Mountain School
Carbondale, CO

Resources:

For review you may use resources available at the following websites:

- http://www2.hcpss.org/math/smart (click on Secondary Mathematics Internet Resources)
- http://www.howa.lib.md.us/ -- free access to *Live Homework Help*
- http://www.algebrahelp.com/
- https://www.khanacademy.org/math/algebra

Arithmetic

- Converting between percents, fractions, and decimals
- Variable and verbal expressions
- Adding, subtracting, multiplying and dividing decimals, fractions and mixed numbers
- Order of operations
- Evaluating variable expressions

Number Theory

- Divisibility and factors
- Factoring numbers and monomials
- Greatest common factor and Least common multiple

Algebraic Expressions

- Evaluating variable expressions
- Simplifying variable expressions
- The distributive property

Equations

- [One-step equations containing fractions](#) and decimals
- [Two-step equations containing decimals](#) and fractions
- [Two-step equation word problems](#)
- [Multi-step equations](#)

Inequalities

- [Graphing single-variable inequalities](#)
- [One-step inequalities by multiplying or dividing](#)
- [Two-step inequalities](#)
- [Multi-step inequalities](#)

Exponents and Radicals

- [Multiplication property of exponents](#)
- [Division property of exponents](#)
- [Powers of products and quotients](#)
- [Writing scientific notation](#)
- [Square roots](#)

Proportions and Percents

- [Converting between percents, fractions, and decimals](#)
- [Percent problems and Finding percent change](#)
- [Proportion word problems](#)
- [Similar figure word problems](#)
- [Simple and compound interest](#)

Linear Functions

- [Finding slope](#)
- [Graphing lines using slope-intercept form](#)
- [Graphing lines using standard form](#)
- [Writing linear equations](#)
- [Graphing linear inequalities](#)

Systems of Equations

- [Solving systems of equations by graphing and substitution](#)

Word Problems

- [One-step and two-step equation word problems](#)
- [Proportion word problems](#)
- [Similar figure word problems](#)
- [Systems of equations word problems](#)

Evaluate each expression.

1) $\left(\dfrac{8}{-8}\right)^2 - (-4)$

2) $\dfrac{7+9}{3-(-5)}$

3) $-\dfrac{24}{(-2)-2} + 9$

4) $\dfrac{15 \times 3 - 3}{-7}$

5) $-\dfrac{10 \times 9 \times 4\frac{4}{9}}{4\frac{1}{2}}$

6) $(-2) \times 4\frac{3}{4} - \left(-\dfrac{1\frac{3}{4}}{3\frac{1}{9}}\right)$

7) $\left(-3\frac{1}{3}\right) - \left(-\frac{3}{2}\right) - \left(\left(-\frac{2}{5}\right) - 9\frac{3}{8}\right)$

8) $5\frac{1}{3}\left(5\frac{8}{9} + 4\frac{4}{5} + \frac{7}{5}\right)$

Simplify each expression.

9) $-3(x + 7) + 3x$

10) $-3(3n + 3) - 6$

11) $-4a + 3(a + 2)$

12) $5b - (b - 3)$

13) $-\dfrac{5}{3}\left(-\dfrac{7}{4}m - \dfrac{1}{2}\right) - \dfrac{3}{2}m$

14) $\dfrac{13}{5}n - \dfrac{1}{4}\left(-\dfrac{1}{4}n + \dfrac{8}{5}\right)$

15) $\dfrac{1}{5}\left(-\dfrac{5}{3}p + 1\right) - \dfrac{3}{2}$

16) $2 + \dfrac{7}{4}\left(\dfrac{3}{5}x + \dfrac{1}{3}\right)$

17) $5(n + 5) + 3n$

18) $4(-5x + 7) - 8x$

19) $-6n + 4(3n - 5)$

20) $8(3n + 8) - 4n$

Write each as a percent. Round to the nearest tenth of a percent.

21) $\dfrac{16}{23}$

22) $\dfrac{47}{50}$

23) $\dfrac{1}{5}$

24) $\dfrac{1}{4}$

Write each as a percent. Write remainders as a fraction.

25) $\dfrac{31}{100}$

26) $9\dfrac{1}{4}$

27) $\dfrac{1}{4}$

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

Evaluate each expression.

29) $4 - \dfrac{8 \times 2}{-4}$

30) $3 - 9 - (-8) \times (-6)$

31) $\dfrac{5 \times 5}{5} - 4$

32) $\dfrac{3 - 10}{1 - (-6)}$

33) $9 - 5 - ((-3) - 3)$

34) $(-3) - (-7)((-1) - 9)$

Evaluate each using the values given.

35) $p^2 + m + n - m$; use $m = -4$, $n = 2$, and $p = 2$

36) $h \times \dfrac{j}{3} + j + j$; use $h = 8$, and $j = -3$

Evaluate each expression.

37) $\dfrac{8}{5} - \left(\dfrac{1}{2} + 1\right)$

38) $1 \div 1\dfrac{1}{2} \times 3\dfrac{2}{5}$

39) $\dfrac{\left(-\dfrac{4}{3}\right) + 1\dfrac{2}{9} - 2}{\left(-\dfrac{4}{5}\right)}$

40) $(-1) + \left(\left(-\dfrac{3}{8}\right) - \dfrac{3}{10}\right)^2$

41) $\left(-1\dfrac{1}{6}\right) - \left(2\dfrac{1}{4} - 1\dfrac{7}{10}\right) + \dfrac{4}{5}$

42) $-\dfrac{2\dfrac{7}{8} \times \left(-1\dfrac{1}{4}\right)}{1\dfrac{1}{9} + 5\dfrac{1}{6}}$

43) $1\dfrac{1}{2} + 2\dfrac{1}{2} \times 3\dfrac{2}{5}$

44) $3\dfrac{3}{4}\left(1\dfrac{3}{4} - 1\dfrac{2}{3}\right)$

45) $2\dfrac{1}{6} + \left(3\dfrac{1}{4}\right)^2$

46) $3\dfrac{2}{3} + 1\dfrac{3}{4} - 3\dfrac{1}{3}$

Simplify each expression.

47) $7(5m + 6) - 6m$

48) $7(n + 7) - 7n$

49) $-8(1 - 8x) + x$

50) $-8(1 + 6a) + 2a$

Solve each equation.

51) $\dfrac{k}{11} = -15$

52) $-119 = -17a$

53) $30 + b = 3$

54) $14 = \dfrac{n}{30}$

55) $\dfrac{n}{11} = -28$

56) $-20 = \dfrac{r}{27}$

57) $7 - 4(1 - 2a) = 33 + 2a$

58) $35 - 5x = 8(x + 6)$

59) $38 + 6m = 4(m + 5) + 6$

60) $-5n - 2(7 + n) = -20 - 6n$

61) Carlos had some candy to give to his five children. He first took two pieces for himself and then evenly divided the rest among his children. Each child received four pieces. With how many pieces did he start?

62) For a field trip 7 students rode in cars and the rest filled eight buses. How many students were in each bus if 407 students were on the trip?

63) How old am I if 500 reduced by 3 times my age is 263?

64) Jose won 69 lollipops playing horseshoes at the county fair. At school he gave three to every student in his math class. He only has 9 remaining. How many students are in his class?

Draw a graph for each inequality.

65) $a < 1.9$
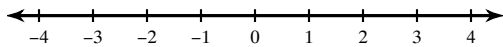
66) $-2.9 \geq p$
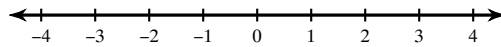
67) $r < 2.6$
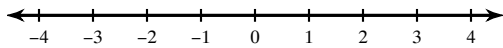
68) $x \leq -1.4$
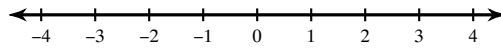
Solve each inequality and graph its solution.
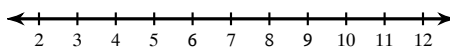
69) $39 - n < 84$
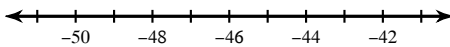
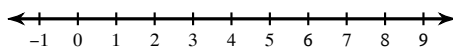70) $55 \geq x - (-16)$
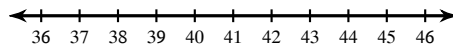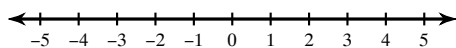

71) $-8v + 8 < 104$
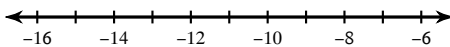
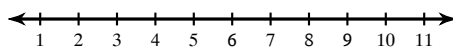72) $\dfrac{x}{9} + 11 \geq 12$
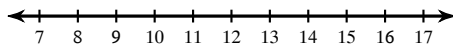
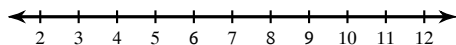73) $8 + 4(2p + 4) < 36 + 6p$

74) $7n + 39 < 4(7n + 6) - 6$

75) $-5(1 + 7b) + 5b \le -32 - 3b$
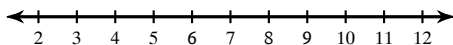

76) $5 - 8(x + 5) \ge -39 - 7x$

77) $10 - 5x < -(4x - 4)$

78) $23 - 5x < -(x + 1)$

Simplify. Your answer should contain only positive exponents.

79) $5n^3 \cdot 4n$

80) $4x^2 \cdot 3x^3$

81) $x^0 \cdot 4x$

82) $r^0 \cdot 6r^2$

83) $\dfrac{3x^2 y^3}{7x^4 y^5}$

84) $\dfrac{6yx^2}{9x^4}$

85) $\dfrac{x^2 y^5}{2x^0 y^4}$

86) $\dfrac{7yx^5}{8xy^4}$

87) $\dfrac{4x}{3x}$

88) $\dfrac{7x^3}{6x^2}$

89) $\dfrac{6x^2}{7x^3}$

90) $\dfrac{6p^3}{5p}$

91) $\dfrac{9n^0}{2n^2}$

92) $\dfrac{10m^4 n^0}{8m^3 n^4}$

93) $\dfrac{9x^0}{y^2}$

94) $\dfrac{7m^5}{8m^5 n^3}$

95) $\dfrac{10x^2 y^3}{8x^0 y^4}$

96) $\dfrac{3a^5 b^5}{7a^5}$

Simplify. Write each answer in scientific notation.

97) $(5 \times 10^6)(7 \times 10^6)$

98) $(5.2 \times 10^6)(2.5 \times 10^1)$

99) $(2.48 \times 10^{-5})(2.2 \times 10^5)$

100) $(3 \times 10^{-3})(8 \times 10^3)$

Solve each problem.

101) 65 is 179% of what?

102) 128 is 58% of what?

103) What percent of 26 is 3?

104) 51 is what percent of 152?

Answer each question and round your answer to the nearest whole number.

105) Riverside and Abbots Rise are 30 km from each other. How far apart would the cities be on a map that has a scale of 4 cm : 15 km?
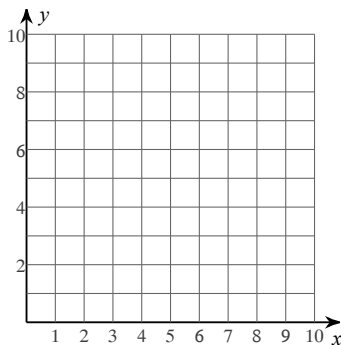
106) A lawn ornament that is 6 ft tall casts a shadow that is 15 ft long. Find the height of a globe that casts a 5 ft shadow.

107) Find the distance between Fairview and Marion on a map with a scale of 2 in : 11 mi if they are actually 22 mi apart.
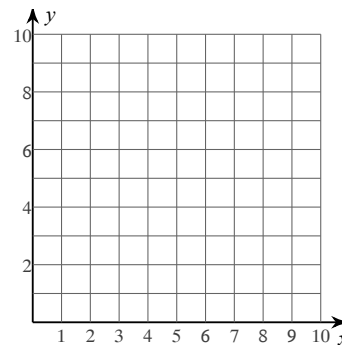
108) Find the distance between Yorkshire and Oak Grove if they are 6 cm apart on a map with a scale of 2 cm : 13 km.

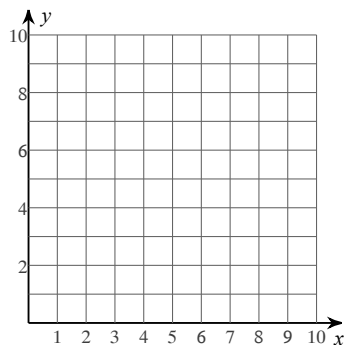**Plot each point.**

109) $I(9, 2)$ $J(6, 4)$ $K(6, 9)$
     $L(1, 8)$ $M(10, 1)$

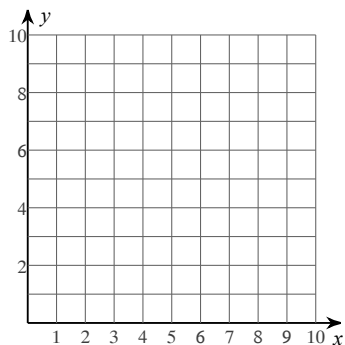110) $S(4, 9)$ $T(1, 6)$ $U(2, 6)$
     $V(5, 5)$ $W(4, 2)$

111) $K(2, 10)$ $J(2, 6)$ $I(3, 5)$
  $H(5, 3)$ $G(7, 2)$

112) $K(10, 8)$ $J(6, 7)$ $I(8, 2)$
  $H(10, 0)$ $G(2, 6)$

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

113) $(3.8, -6.6)$, $(-5.27, 7.9)$

114) $(5.1, -10.9)$, $(-10.2, 3.6)$

115) $(-11.9, 3.8)$, $(-6.6, -5.27)$

116) $(8.4, 5.1)$, $(-10.9, -10.2)$

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

117) $(9, 17), (-17, 17)$

118) $(-4, 15), (17, 3)$

119) $(1, 19), (-14, -20)$
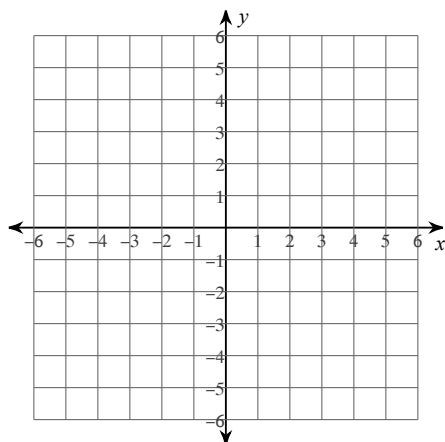
120) $(11, 1), (-4, -14)$

121) $(10, -11), (-1, -4)$

122) $(-13, 17), (-17, 17)$

123) $(6, -16), (-3, 4)$

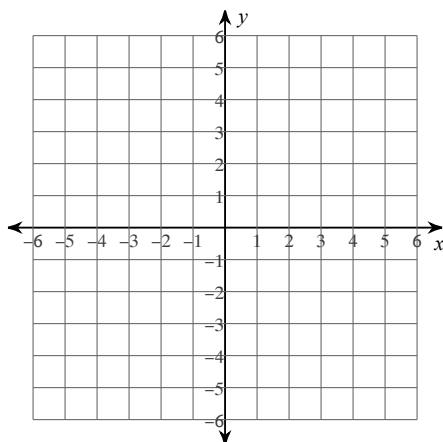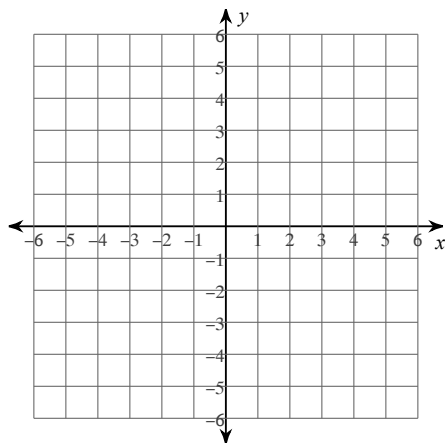124) $(-8, 19), (-12, 17)$

Sketch the graph of each line.

125) $y = \frac{1}{2}x + 2$

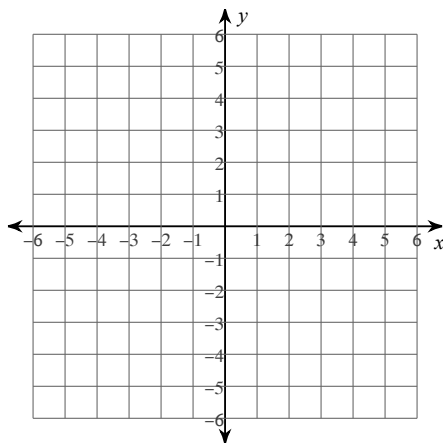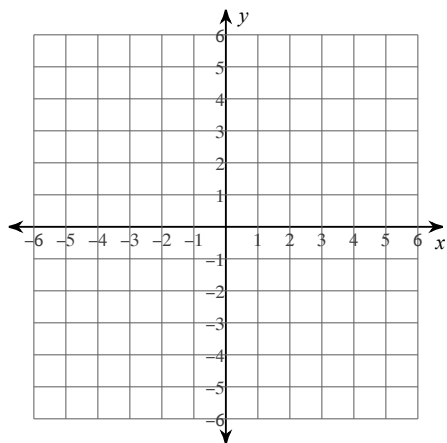126) $y = \frac{1}{2}x + 4$
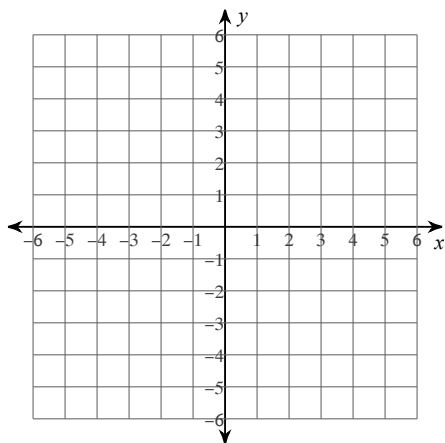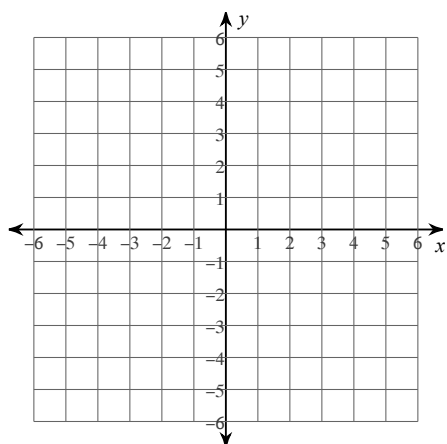
127) $y = -8x - 3$

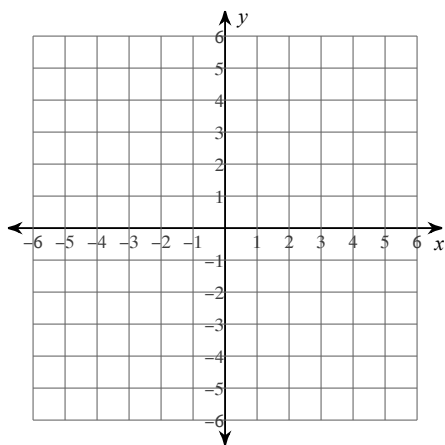128) $y = -6x + 2$
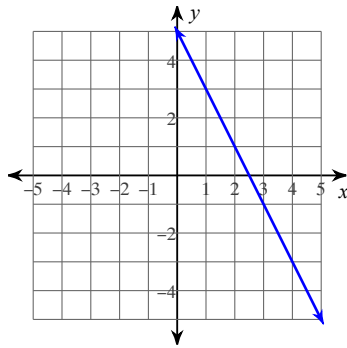
129) $y = -5x$

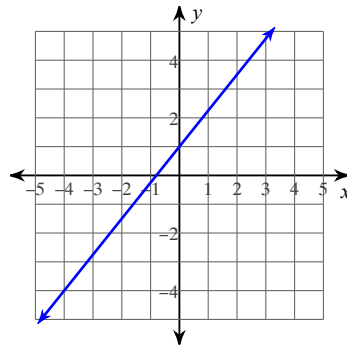130) $y = -5x + 1$

131) $y = 1$

132) $y = \dfrac{3}{2}x - 3$

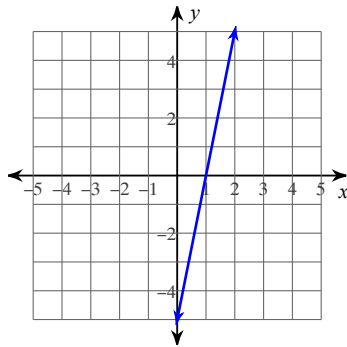**Write the slope-intercept form of the equation of each line.**
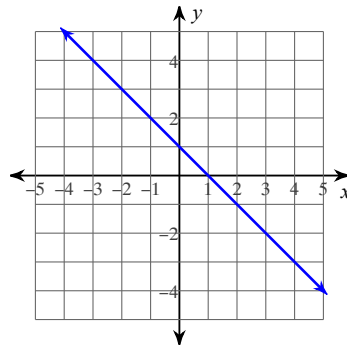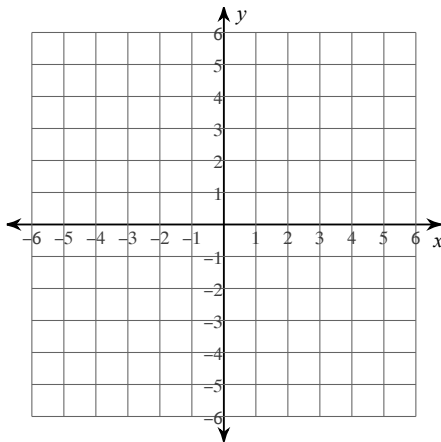
133)

134)

135)

136)
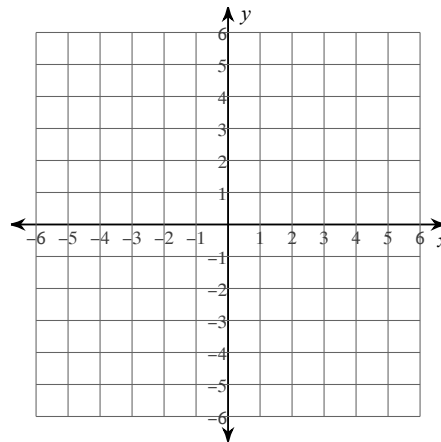

Sketch the graph of each linear inequality.

137) $y \geq x - 3$

138) $y < x - 3$

Solve each system by graphing.

139) $y = -\dfrac{2}{7}x - 1$

$y = \dfrac{2}{7}x - 5$

140) $x = 8$

$y = -\dfrac{3}{4}x - 2$

141) $y = -8$

$y = -x - 4$

142) $y = -\dfrac{3}{8}x - 3$

$y = -\dfrac{13}{8}x + 7$

Solve each system by substitution.

143) $-5x - 3y = 19$

$y = 2$

144) $-2x - 4y = 22$

$y = -3$

145) $7x + 8y = 0$

$y = 7$

146) $2x + 6y = -14$

$y = 2x$

147) There are 17 animals in the field. Some are pigs and some are geese. There are 52 legs in all. How many of each animal are in the field?

148) A class of 234 students went on a field trip. They took 8 vehicles, some cars and some buses. Find the number of cars and the number of buses they took if each car holds 3 students and each bus hold 45 students.

149) There are 13 animals in the barn. Some are chickens and some are horses. There are 44 legs in all. How many of each animal are there?

150) There are 23 animals in the barn. Some are geese and some are cows. There are 82 legs in all. How many of each animal are there?

151) Brenda wants to buy a radio for $67.34. She gives the cashier $80. How much change does she receive?

152) Nine years ago, Nicole was 57 years old. How old is she now?

153) Eduardo bought six hats. A week later half of all his hats were lost during a move. There are now only 16 hats left. With how many did he start?

154) Brenda won 77 pieces of gum playing horseshoes at the county fair. At school she gave four to every student in her math class. She only has 1 remaining. How many students are in her class?

Answer each question and round your answer to the nearest whole number.

155) Kathryn reduced the size of a frame to a width of 5 cm. What is the new height if it was originally 18 cm tall and 45 cm wide?

156) Amy was planning a trip to Argentina. Before going, she did some research and learned that the exchange rate is 3 Pesos = $1. How many Pesos would she get if she exchanged $14?

157) A painting is 42 cm wide and 28 cm tall. If it is reduced to a height of 4 cm, then how wide will it be?

158) A triangle is 24 cm tall and 36 cm wide. If it is reduced to a height of 4 cm, then how wide will it be?

159) Find the distance between Mount Pleasant and Union on a map with a scale of 2 cm : 13 km if they are actually 52 km apart.

160) A 20 ft tall tree standing next to a woman casts a 4 ft shadow. If the woman casts a shadow that is 1 ft long, then how tall is she?

161) A particular house is 10 m tall. A model of it was built with a scale of 3 cm : 5 m. How tall is the model?

162) A map has a scale of 2 cm : 13 km. If Santa Cruz and Georgetown are 10 cm apart on the map, then how far apart are the real cities?

163) Elisa spent $39 on eating utensils. Spoons cost $4 and forks cost $5. If she bought a total of 9, then how many of each kind did she buy?

164) There are 21 animals in the barn. Some are ducks and some are oxen. There are 70 legs in all. How many of each animal are there?

Simplify each expression.

165) $\left(-1 + 7p + 9p^2\right) + \left(14p + 6p^2 + 1\right)$

166) $\left(-5x^3 + 2x + 9x^4\right) - \left(13x + 13x^4 + x^3\right)$

167) $\left(-5x^2 - 8x^4 - 12x^5\right) - \left(-2x^2 - 7x^5 - 11x^4\right)$

168) $\left(4n^2 - 12n^4 - 9n^3\right) - \left(-14n^2 + 14n - 14n^4\right)$

169) $\left(10m^4 + 2m^2 - 7m^3\right) - \left(2m^4 - 2m^2 + 4m^3\right)$

170) $\left(14x^4 - x^3 - 4x\right) - \left(11x^5 + 13x^3 + 14x^4\right)$

Find each product.

171) $5\left(6x^2 + 7x + 3\right)$

172) $-3\left(4x^2 - 6x - 5\right)$

173) $-3\left(-6x^2 - 8x - 1\right)$

174) $-6\left(7m^2 - 6m + 4\right)$

175) $4\left(-6m^2 - 5m + 7\right)$

176) $4\left(-5b^2 + 7b - 6\right)$

Write the prime factorization of each. Do not use exponents.

177) 48

178) 39

179) 43

180) 38

181) 70

182) 74

183) 44

184) 66

Assignment

Evaluate each expression.

1) $\left(\dfrac{8}{-8}\right)^2 - (-4)$

    5

2) $\dfrac{7+9}{3-(-5)}$

    2

3) $-\dfrac{24}{(-2)-2} + 9$

    15

4) $\dfrac{15 \times 3 - 3}{-7}$

    −6

5) $-\dfrac{10 \times 9 \times 4\frac{4}{9}}{4\frac{1}{2}}$

    $-88\dfrac{8}{9}$

6) $(-2) \times 4\dfrac{3}{4} - \left(-\dfrac{1\frac{3}{4}}{3\frac{1}{9}}\right)$

    $-8\dfrac{15}{16}$

7) $\left(-3\dfrac{1}{3}\right) - \left(-\dfrac{3}{2}\right) - \left(\left(-\dfrac{2}{5}\right) - 9\dfrac{3}{8}\right)$

    $7\dfrac{113}{120}$

8) $5\dfrac{1}{3}\left(5\dfrac{8}{9} + 4\dfrac{4}{5} + \dfrac{7}{5}\right)$

    $64\dfrac{64}{135}$

Simplify each expression.

9) $-3(x + 7) + 3x$

    −21

10) $-3(3n + 3) - 6$

    −9n − 15

11) $-4a + 3(a + 2)$

    −a + 6

12) $5b - (b - 3)$

    4b + 3

13) $-\dfrac{5}{3}\left(-\dfrac{7}{4}m - \dfrac{1}{2}\right) - \dfrac{3}{2}m$ $\dfrac{17}{12}m + \dfrac{5}{6}$

14) $\dfrac{13}{5}n - \dfrac{1}{4}\left(-\dfrac{1}{4}n + \dfrac{8}{5}\right)$ $\dfrac{213}{80}n - \dfrac{2}{5}$

15) $\dfrac{1}{5}\left(-\dfrac{5}{3}p + 1\right) - \dfrac{3}{2}$ $-\dfrac{13}{10} - \dfrac{1}{3}p$

16) $2 + \dfrac{7}{4}\left(\dfrac{3}{5}x + \dfrac{1}{3}\right)$ $\dfrac{31}{12} + \dfrac{21}{20}x$

17) $5(n + 5) + 3n$

    8n + 25

18) $4(-5x + 7) - 8x$

    −28x + 28

19) $-6n + 4(3n - 5)$

    6n − 20

20) $8(3n + 8) - 4n$

    20n + 64

Write each as a percent. Round to the nearest tenth of a percent.

21) $\dfrac{16}{23}$

69.6%

22) $\dfrac{47}{50}$

94%

23) $\dfrac{1}{5}$

20%

24) $\dfrac{1}{4}$

25%

Write each as a percent. Write remainders as a fraction.

25) $\dfrac{31}{100}$

31%

26) $9\dfrac{1}{4}$

925%

27) $\dfrac{1}{4}$

25%

28) $\dfrac{1}{3}$ $33\dfrac{1}{3}\%$

Evaluate each expression.

29) $4 - \dfrac{8 \times 2}{-4}$

8

30) $3 - 9 - (-8) \times (-6)$

−54

31) $\dfrac{5 \times 5}{5} - 4$

1

32) $\dfrac{3 - 10}{1 - (-6)}$

−1

33) $9 - 5 - ((-3) - 3)$

10

34) $(-3) - (-7)((-1) - 9)$

−73

Evaluate each using the values given.

35) $p^2 + m + n - m$; use $m = -4$, $n = 2$, and $p = 2$

6

36) $h \times \dfrac{j}{3} + j + j$; use $h = 8$, and $j = -3$

−14

Evaluate each expression.

37) $\dfrac{8}{5} - \left(\dfrac{1}{2} + 1\right)$

$\dfrac{1}{10}$

38) $1 \div 1\dfrac{1}{2} \times 3\dfrac{2}{5}$

$2\dfrac{4}{15}$

39) $\dfrac{\left(-\dfrac{4}{3}\right) + 1\dfrac{2}{9} - 2}{\left(-\dfrac{4}{5}\right)}$

$2\dfrac{23}{36}$

40) $(-1) + \left(\left(-\dfrac{3}{8}\right) - \dfrac{3}{10}\right)^2$

$-\dfrac{871}{1600}$

41) $\left(-1\dfrac{1}{6}\right) - \left(2\dfrac{1}{4} - 1\dfrac{7}{10}\right) + \dfrac{4}{5}$

$-\dfrac{11}{12}$

42) $-\dfrac{2\dfrac{7}{8} \times \left(-1\dfrac{1}{4}\right)}{1\dfrac{1}{9} + 5\dfrac{1}{6}}$

$\dfrac{1035}{1808}$

43) $1\dfrac{1}{2} + 2\dfrac{1}{2} \times 3\dfrac{2}{5}$

10

44) $3\dfrac{3}{4}\left(1\dfrac{3}{4} - 1\dfrac{2}{3}\right)$

$\dfrac{5}{16}$

45) $2\dfrac{1}{6} + \left(3\dfrac{1}{4}\right)^2$

$12\dfrac{35}{48}$

46) $3\dfrac{2}{3} + 1\dfrac{3}{4} - 3\dfrac{1}{3}$

$2\dfrac{1}{12}$

Simplify each expression.

47) $7(5m + 6) - 6m$

$29m + 42$

48) $7(n + 7) - 7n$

49

49) $-8(1 - 8x) + x$

$-8 + 65x$

50) $-8(1 + 6a) + 2a$

$-8 - 46a$

Solve each equation.

51) $\dfrac{k}{11} = -15$

$\{-165\}$

52) $-119 = -17a$

$\{7\}$

53) $30 + b = 3$

$\{-27\}$

54) $14 = \dfrac{n}{30}$

$\{420\}$

55) $\dfrac{n}{11} = -28$

$\{-308\}$

56) $-20 = \dfrac{r}{27}$

$\{-540\}$

57) $7 - 4(1 - 2a) = 33 + 2a$

$\{5\}$

58) $35 - 5x = 8(x + 6)$

$\{-1\}$

59) $38 + 6m = 4(m + 5) + 6$

$\{-6\}$

60) $-5n - 2(7 + n) = -20 - 6n$

$\{6\}$

61) Carlos had some candy to give to his five children. He first took two pieces for himself and then evenly divided the rest among his children. Each child received four pieces. With how many pieces did he start?

22

62) For a field trip 7 students rode in cars and the rest filled eight buses. How many students were in each bus if 407 students were on the trip?
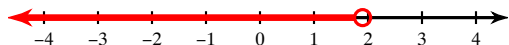
50

63) How old am I if 500 reduced by 3 times my age is 263?

79

64) Jose won 69 lollipops playing horseshoes at the county fair. At school he gave three to every student in his math class. He only has 9 remaining. How many students are in his class?

20

Draw a graph for each inequality.

65) $a < 1.9$

66) $-2.9 \geq p$
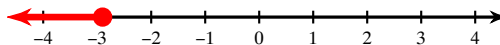
67) $r < 2.6$
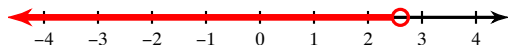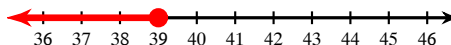

68) $x \leq -1.4$
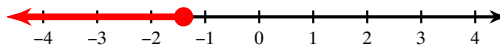
Solve each inequality and graph its solution.

69) $39 - n < 84$
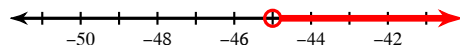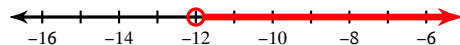

$n > -45$

70) $55 \geq x - (-16)$
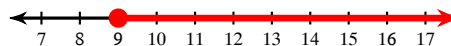

$x \leq 39$

71) $-8v + 8 < 104$
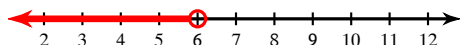

$v > -12$

72) $\dfrac{x}{9} + 11 \geq 12$

$x \geq 9$

73) $8 + 4(2p + 4) < 36 + 6p$
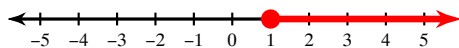

$p < 6$

74) $7n + 39 < 4(7n + 6) - 6$
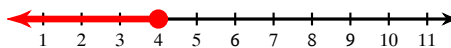

$n > 1$

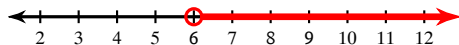75) $-5(1 + 7b) + 5b \le -32 - 3b$

$b \ge 1$

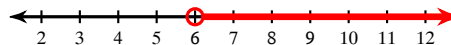76) $5 - 8(x + 5) \ge -39 - 7x$

$x \le 4$

77) $10 - 5x < -(4x - 4)$

$x > 6$

78) $23 - 5x < -(x + 1)$

$x > 6$

Simplify. Your answer should contain only positive exponents.

79) $5n^3 \cdot 4n$

$20n^4$

80) $4x^2 \cdot 3x^3$

$12x^5$

81) $x^0 \cdot 4x$

$4x$

82) $r^0 \cdot 6r^2$

$6r^2$

83) $\dfrac{3x^2y^3}{7x^4y^5}$ $\dfrac{3}{7x^2y^2}$

84) $\dfrac{6yx^2}{9x^4}$ $\dfrac{2y}{3x^2}$

85) $\dfrac{x^2y^5}{2x^0y^4}$ $\dfrac{x^2y}{2}$

86) $\dfrac{7yx^5}{8xy^4}$ $\dfrac{7x^4}{8y^3}$

87) $\dfrac{4x}{3x}$ $\dfrac{4}{3}$

88) $\dfrac{7x^3}{6x^2}$ $\dfrac{7x}{6}$

89) $\dfrac{6x^2}{7x^3}$ $\dfrac{6}{7x}$

90) $\dfrac{6p^3}{5p}$ $\dfrac{6p^2}{5}$

91) $\dfrac{9n^0}{2n^2}$ $\dfrac{9}{2n^2}$

92) $\dfrac{10m^4n^0}{8m^3n^4}$ $\dfrac{5m}{4n^4}$

93) $\dfrac{9x^0}{y^2}$ $\dfrac{9}{y^2}$

94) $\dfrac{7m^5}{8m^5n^3}$ $\dfrac{7}{8n^3}$

95) $\dfrac{10x^2y^3}{8x^0y^4}$ $\dfrac{5x^2}{4y}$

96) $\dfrac{3a^5b^5}{7a^5}$ $\dfrac{3b^5}{7}$

Simplify. Write each answer in scientific notation.

97) $(5 \times 10^6)(7 \times 10^6)$

3.5×10^{13}

98) $(5.2 \times 10^6)(2.5 \times 10^1)$

1.3×10^8

99) $(2.48 \times 10^{-5})(2.2 \times 10^5)$

5.456×10^0

100) $(3 \times 10^{-3})(8 \times 10^3)$

2.4×10^1

Solve each problem.

101) 65 is 179% of what?

36.3

102) 128 is 58% of what?

220.7

103) What percent of 26 is 3?

11.5%

104) 51 is what percent of 152?

33.6%

Answer each question and round your answer to the nearest whole number.

105) Riverside and Abbots Rise are 30 km from each other. How far apart would the cities be on a map that has a scale of 4 cm : 15 km?

8 cm

106) A lawn ornament that is 6 ft tall casts a shadow that is 15 ft long. Find the height of a globe that casts a 5 ft shadow.

2 ft

107) Find the distance between Fairview and Marion on a map with a scale of 2 in : 11 mi if they are actually 22 mi apart.
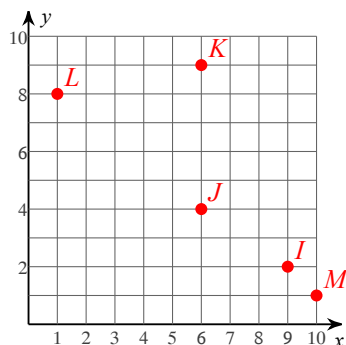
4 in

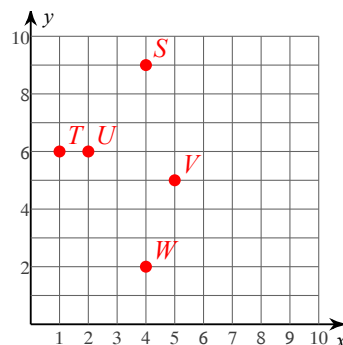108) Find the distance between Yorkshire and Oak Grove if they are 6 cm apart on a map with a scale of 2 cm : 13 km.

39 km

Plot each point.

109) $I(9, 2)$ $J(6, 4)$ $K(6, 9)$
$L(1, 8)$ $M(10, 1)$

110) $S(4, 9)$ $T(1, 6)$ $U(2, 6)$
$V(5, 5)$ $W(4, 2)$

111) $K(2, 10)$ $J(2, 6)$ $I(3, 5)$
$\quad\,$ $H(5, 3)$ $G(7, 2)$
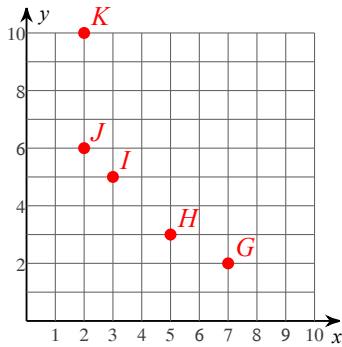
112) $K(10, 8)$ $J(6, 7)$ $I(8, 2)$
$\quad\,$ $H(10, 0)$ $G(2, 6)$
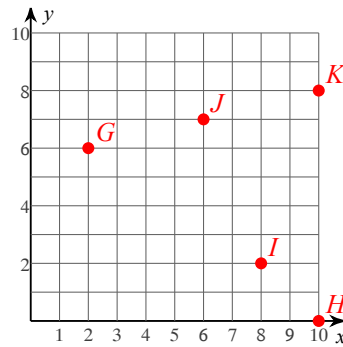
Find the midpoint of the line segment with the given endpoints.

113) $(3.8, -6.6)$, $(-5.27, 7.9)$

$(-0.735, 0.65)$

114) $(5.1, -10.9)$, $(-10.2, 3.6)$

$(-2.55, -3.65)$

115) $(-11.9, 3.8)$, $(-6.6, -5.27)$

$(-9.25, -0.735)$

116) $(8.4, 5.1)$, $(-10.9, -10.2)$

$(-1.25, -2.55)$

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

117) $(9, 17)$, $(-17, 17)$

0

118) $(-4, 15)$, $(17, 3)$ $\quad -\dfrac{4}{7}$

119) $(1, 19)$, $(-14, -20)$ $\quad \dfrac{13}{5}$

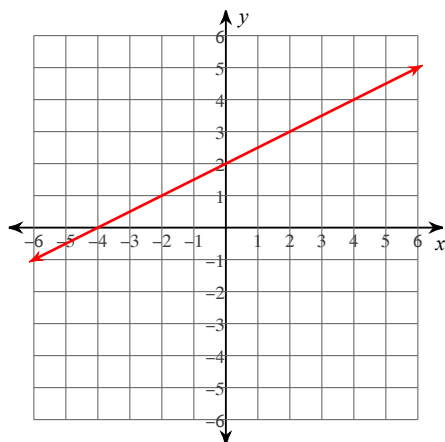120) $(11, 1)$, $(-4, -14)$

1

121) $(10, -11)$, $(-1, -4)$ $\quad -\dfrac{7}{11}$

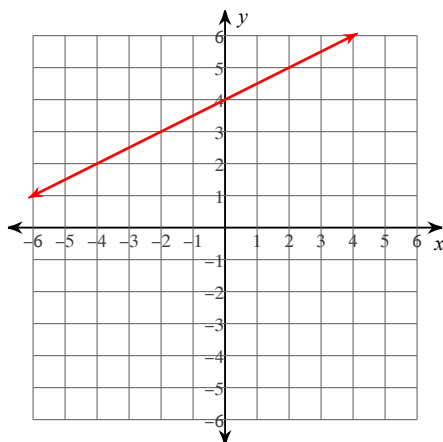122) $(-13, 17)$, $(-17, 17)$

0

123) $(6, -16)$, $(-3, 4)$ $\quad -\dfrac{20}{9}$

124) $(-8, 19)$, $(-12, 17)$ $\quad \dfrac{1}{2}$

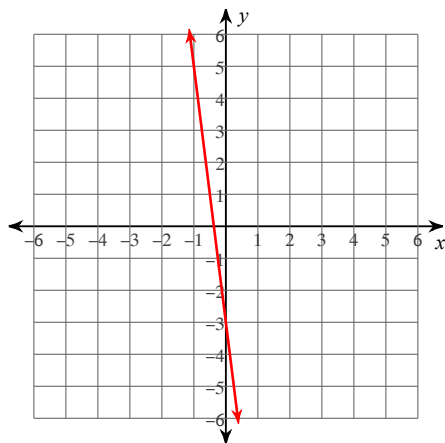**Sketch the graph of each line.**

125) $y = \dfrac{1}{2}x + 2$

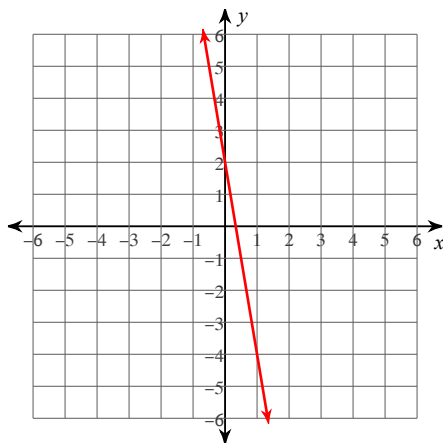

126) $y = \dfrac{1}{2}x + 4$
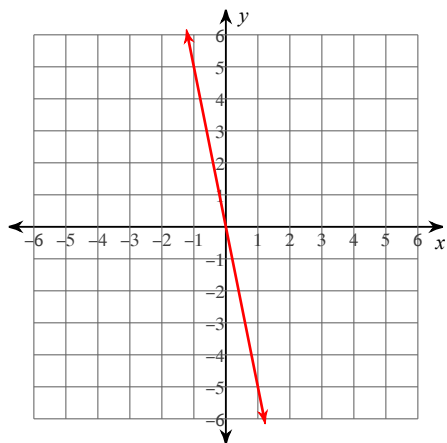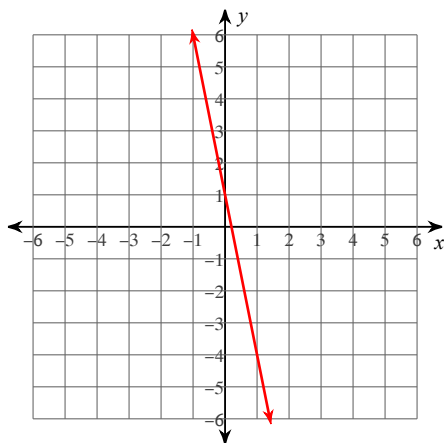

127) $y = -8x - 3$
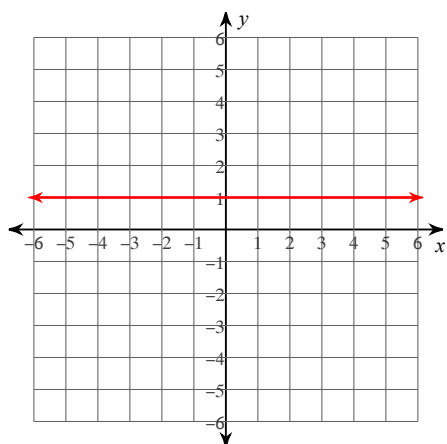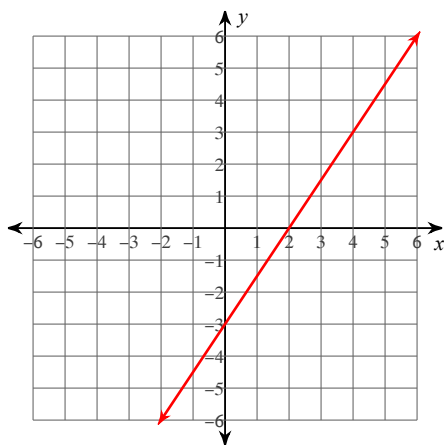

128) $y = -6x + 2$

129) $y = -5x$

130) $y = -5x + 1$

131) $y = 1$
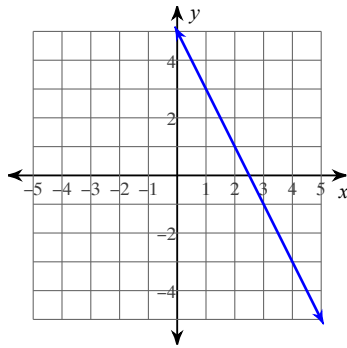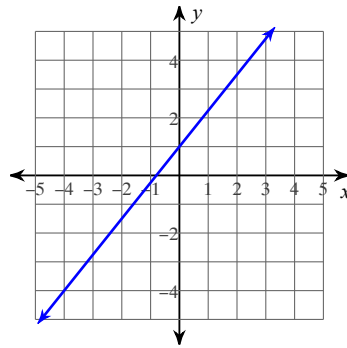
132) $y = \dfrac{3}{2}x - 3$

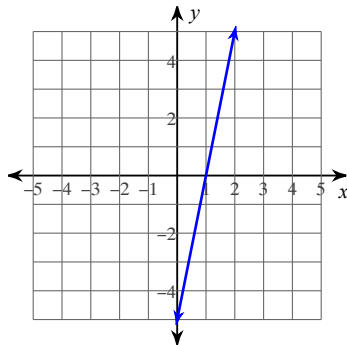**Write the slope-intercept form of the equation of each line.**

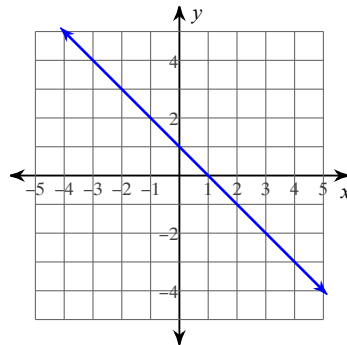133)

$y = -2x + 5$

134)

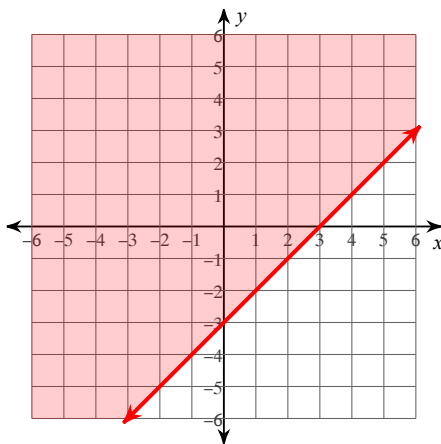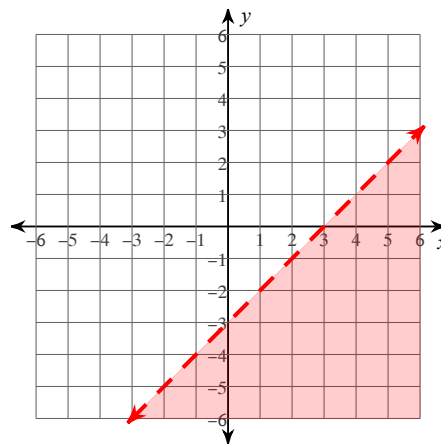$y = \dfrac{5}{4}x + 1$

135)

$y = 5x - 5$

136)

$y = -x + 1$

Sketch the graph of each linear inequality.

137) $y \geq x - 3$

138) $y < x - 3$

Solve each system by graphing.

139) $y = -\dfrac{2}{7}x - 1$

$y = \dfrac{2}{7}x - 5$

$(7, -3)$

140) $x = 8$

$y = -\dfrac{3}{4}x - 2$

$(8, -8)$

141) $y = -8$

$y = -x - 4$

$(4, -8)$

142) $y = -\dfrac{3}{8}x - 3$

$y = -\dfrac{13}{8}x + 7$

$(8, -6)$

Solve each system by substitution.

143) $-5x - 3y = 19$

$y = 2$

$(-5, 2)$

144) $-2x - 4y = 22$

$y = -3$

$(-5, -3)$

145) $7x + 8y = 0$

$y = 7$

$(-8, 7)$

146) $2x + 6y = -14$

$y = 2x$

$(-1, -2)$

147) There are 17 animals in the field. Some are pigs and some are geese. There are 52 legs in all. How many of each animal are in the field?

8 geese and 9 pigs

148) A class of 234 students went on a field trip. They took 8 vehicles, some cars and some buses. Find the number of cars and the number of buses they took if each car holds 3 students and each bus hold 45 students.

3 cars and 5 buses

149) There are 13 animals in the barn. Some are chickens and some are horses. There are 44 legs in all. How many of each animal are there?

4 chickens and 9 horses

150) There are 23 animals in the barn. Some are geese and some are cows. There are 82 legs in all. How many of each animal are there?

5 geese and 18 cows

151) Brenda wants to buy a radio for $67.34. She gives the cashier $80. How much change does she receive?

$12.66

152) Nine years ago, Nicole was 57 years old. How old is she now?

66

153) Eduardo bought six hats. A week later half of all his hats were lost during a move. There are now only 16 hats left. With how many did he start?

26

154) Brenda won 77 pieces of gum playing horseshoes at the county fair. At school she gave four to every student in her math class. She only has 1 remaining. How many students are in her class?

19

Answer each question and round your answer to the nearest whole number.

155) Kathryn reduced the size of a frame to a width of 5 cm. What is the new height if it was originally 18 cm tall and 45 cm wide?

2 cm

156) Amy was planning a trip to Argentina. Before going, she did some research and learned that the exchange rate is 3 Pesos = $1. How many Pesos would she get if she exchanged $14?

42 Pesos

157) A painting is 42 cm wide and 28 cm tall. If it is reduced to a height of 4 cm, then how wide will it be?

6 cm

158) A triangle is 24 cm tall and 36 cm wide. If it is reduced to a height of 4 cm, then how wide will it be?

6 cm

159) Find the distance between Mount Pleasant and Union on a map with a scale of 2 cm : 13 km if they are actually 52 km apart.

8 cm

160) A 20 ft tall tree standing next to a woman casts a 4 ft shadow. If the woman casts a shadow that is 1 ft long, then how tall is she?

5 ft

161) A particular house is 10 m tall. A model of it was built with a scale of 3 cm : 5 m. How tall is the model?

6 cm

162) A map has a scale of 2 cm : 13 km. If Santa Cruz and Georgetown are 10 cm apart on the map, then how far apart are the real cities?

65 km

163) Elisa spent $39 on eating utensils. Spoons cost $4 and forks cost $5. If she bought a total of 9, then how many of each kind did she buy?

6 spoons and 3 forks

164) There are 21 animals in the barn. Some are ducks and some are oxen. There are 70 legs in all. How many of each animal are there?

7 ducks and 14 oxen

Simplify each expression.

165) $\left(-1 + 7p + 9p^2\right) + \left(14p + 6p^2 + 1\right)$

$15p^2 + 21p$

166) $\left(-5x^3 + 2x + 9x^4\right) - \left(13x + 13x^4 + x^3\right)$

$-4x^4 - 6x^3 - 11x$

167) $\left(-5x^2 - 8x^4 - 12x^5\right) - \left(-2x^2 - 7x^5 - 11x^4\right)$

$-5x^5 + 3x^4 - 3x^2$

168) $\left(4n^2 - 12n^4 - 9n^3\right) - \left(-14n^2 + 14n - 14n^4\right)$

$2n^4 - 9n^3 + 18n^2 - 14n$

169) $\left(10m^4 + 2m^2 - 7m^3\right) - \left(2m^4 - 2m^2 + 4m^3\right)$

$8m^4 - 11m^3 + 4m^2$

170) $\left(14x^4 - x^3 - 4x\right) - \left(11x^5 + 13x^3 + 14x^4\right)$

$-11x^5 - 14x^3 - 4x$

Find each product.

171) $5\left(6x^2 + 7x + 3\right)$

$30x^2 + 35x + 15$

172) $-3\left(4x^2 - 6x - 5\right)$

$-12x^2 + 18x + 15$

173) $-3\left(-6x^2 - 8x - 1\right)$

$18x^2 + 24x + 3$

174) $-6\left(7m^2 - 6m + 4\right)$

$-42m^2 + 36m - 24$

175) $4\left(-6m^2 - 5m + 7\right)$

$-24m^2 - 20m + 28$

176) $4\left(-5b^2 + 7b - 6\right)$

$-20b^2 + 28b - 24$

Write the prime factorization of each. Do not use exponents.

177) 48

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 3$

178) 39

$3 \cdot 13$

179) 43

43

180) 38

$2 \cdot 19$

181) 70

$2 \cdot 5 \cdot 7$

182) 74

$2 \cdot 37$

183) 44

$2 \cdot 2 \cdot 11$

184) 66

$2 \cdot 3 \cdot 11$