

**Algebra I Honors
Summer Assignment 2019**

NO DECIMALS!!! NO MIXED NUMBERS!!!

LINEAR FUNCTIONS

Write each equation in SLOPE-INTERCEPT form. Identify the slope and the x- and y-intercepts.

1. $y - 6 = -3(x + 2)$

Slope-Intercept Form: _____

Slope: _____

y-intercept: _____

x-intercept: _____

2. $7x - 9y = 12$

Slope-Intercept Form: _____

Slope: _____

y-intercept: _____

x-intercept: _____

3. $24x + 9y = -45$

Slope-Intercept Form: _____

Slope: _____

y-intercept: _____

x-intercept: _____

4. $y - 19 = \frac{1}{2}(x + 2)$

Slope-Intercept Form: _____

Slope: _____

y-intercept: _____

x-intercept: _____

5. $\frac{3}{5}y + \frac{7}{2}x + 5 = -\frac{8}{5}$

Slope-Intercept Form: _____

Slope: _____

y-intercept: _____

x-intercept: _____

6. $y + \frac{4}{3} = \frac{2}{3}(x + 6)$

Slope-Intercept Form: _____

Slope: _____

y-intercept: _____

x-intercept: _____

Write each equation in STANDARD form. Identify the x- and y- intercepts.

7. $y = -5x - 12$

Standard Form: _____

x-intercept: _____

y-intercept: _____

8. $y - 9 = -10(x + 3)$

Standard Form: _____

x-intercept: _____

y-intercept: _____

9. $y + 4 = 5x - 2$

Standard Form: _____

x-intercept: _____

y-intercept: _____

10. $y = \frac{5}{2}x + 8$

Standard Form: _____

x-intercept: _____

y-intercept: _____

Use the given points and write the equations for the lines as requested.

11. Write the equation (*in slope-intercept form*) for the line that is parallel to the line that contains the points, (8,10) & (-4,-5), and goes through the point, (2,-3).

12. Write the equation (*in slope-intercept form*) for the line that is perpendicular to the line that contains the points, (6,1) & (-6,-8), and goes through the point, (2,-1).

13. Write the equation (*in point-slope form*) for the line parallel to $y = \frac{5}{3}x + 4$ and passes through (5, -2).

14. Write the equation (*in point-slope form*) for the line perpendicular to $y = -\frac{1}{4}x + 3$ and that passes through (-5, -2).

15. Write the equation (*in standard form*) for the line parallel to $y = 5x - 1$ that passes through $(-\frac{4}{3}, \frac{7}{2})$.

16. Write the equation (***in standard form***) for the line parallel to $y = \frac{3}{4}x + 8$ that passes through $(-1, -9)$.
17. Write the equation for the line that is perpendicular to the line that contains $(9,3)$ & $(-4,3)$ and passes through $(\frac{5}{3}, -\frac{2}{3})$.
18. $(3, -4)$ & $(-2, 2)$, the **slope-intercept** equation of the PARALLEL line that passes through $(5, 1)$.
19. $(2, -5)$ & $(-4, 4)$, the **standard form** equation of the PERPENDICULAR line that passes through $(1, 6)$
20. Write the equation (**in slope-intercept form**) for the line that is parallel to $y = -3x - 12$ and contains the point $(-2, 1)$.
21. Write the equation (**in standard form**) for the line that is perpendicular to $y = 4x - 1$ and contains the point $(-3, 8)$.
22. What is the slope of the line that is perpendicular to the line that contains $(4, 2)$ & $(-10, 14)$?
23. What is the y-intercept of the line that is parallel to $y = \frac{2}{3}x - 4$ and contains the point $(6, 0)$?
24. What is the slope of the line perpendicular to $x = -3$?

Decide if these lines are parallel, perpendicular, or neither. Show your work.

25. Line #1 contains $(4, 0)$ & $(4, -7)$. Line #2 contains $(-2, 10)$ & $(4, 10)$
26. Line #1 contains $(2, -5)$ & $(-4, 5)$. Line #2 contains $(0, 6)$ & $(-5, 3)$
27. Line #1 contains $(1, -3)$ & $(2, 3)$. Line #2 contains $(4, 6)$ & $(3, 0)$.

Find the missing coordinate for each point. Show your work.

28. Slope = 6 $(2, -4)$ & $(x, 8)$ $x =$ _____

29. Slope = $\frac{2}{5}$ $(2, y)$ & $(-3, 6)$ $y =$ _____

Write a rule ($y=mx+b$) for the function.

25.

x	1	2	3	4	5
y	-14	-10	-6	-2	2

26.

x	1	2	3	4	5
y	21	16	11	6	1

27.

x	1	4	7
y	-14	-10	-6

28.

x	1	6	11
y	10	4	-2

Inequalities & Parallel/Perpendicular Lines

Graph the following inequalities.

29. $y + 8 > 3x + 5$

30. $4x - 3y \leq -9$

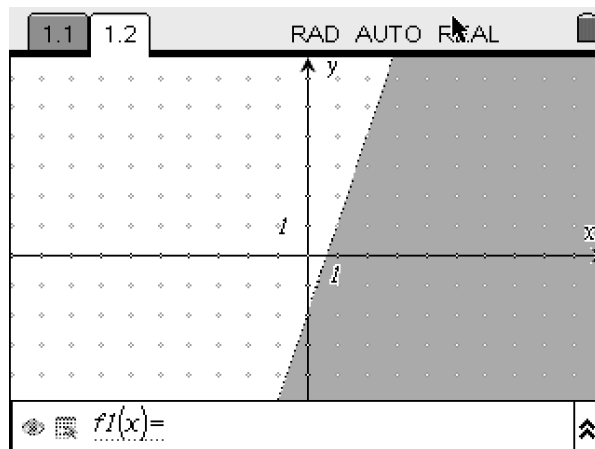
Determine if the ordered pair is a solution for the inequality.

31. $-3x + 8y \leq -4$; (5,2)

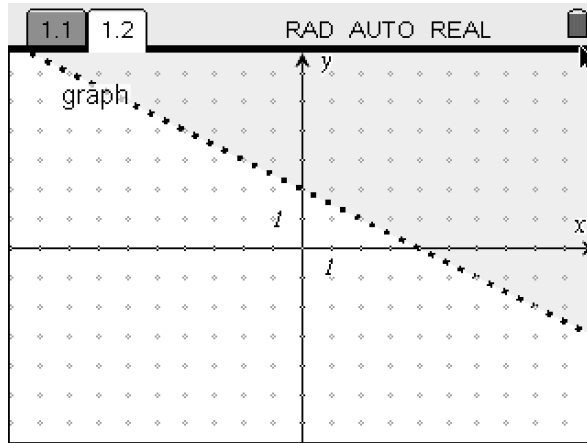
32. $-9y + 8 > 27x - 10$; $(-\frac{1}{5}, \frac{5}{6})$

Write an inequality for each graph.

33.



34.



35. You should be able to graph an inequality using a graphing calculator. You may be asked to demonstrate this to your teacher!

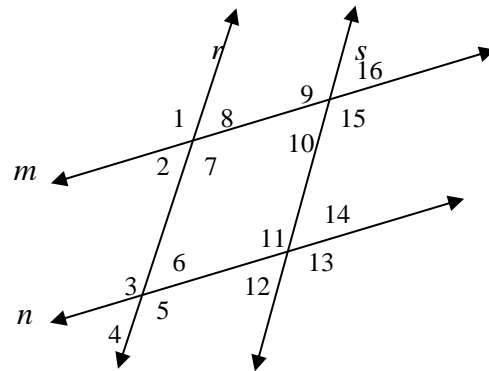
Find the indicated measures. $r \parallel s, m \parallel n$

36. If $m\angle 1 = 140$, find $m\angle 11$.

37. If $m\angle 2 = 25$, find $m\angle 3$.

38. If $m\angle 6 = 55$, find $m\angle 2$.

39. If $m\angle 9 = 125$, find $m\angle 3$.

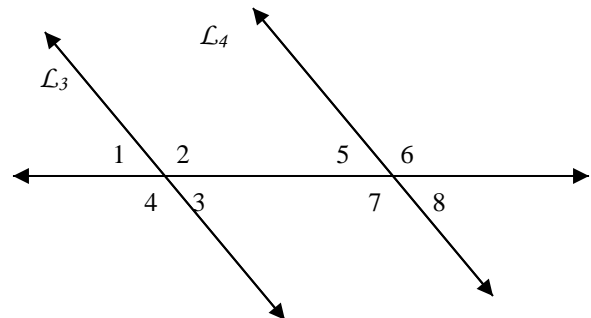


If $\ell_3 \parallel \ell_4$, $m\angle 3 = (2x - 10)^\circ$, and $m\angle 7 = (x + 70)^\circ$, find each angle measure in the figure.

40. $m\angle 4$ _____

41. $m\angle 3$ _____

42. $m\angle 6$ _____



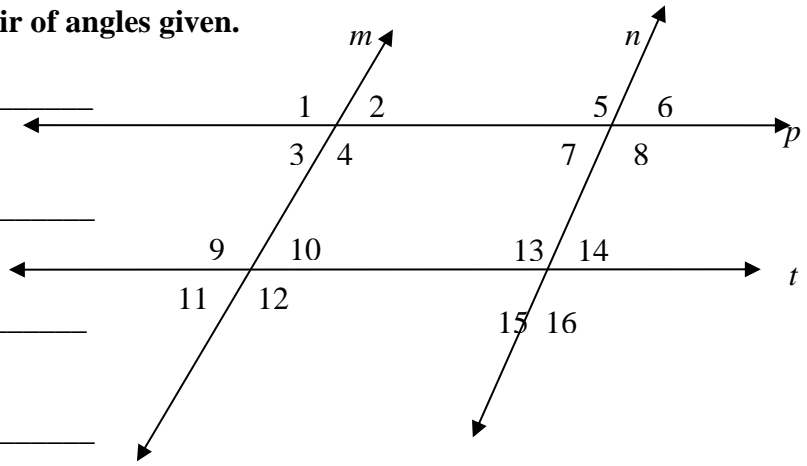
Name the type of angles that describe the pair of angles given.

43. $\angle 4$ & $\angle 7$ _____

44. $\angle 4$ & $\angle 12$ _____

45. $\angle 14$ & $\angle 7$ _____

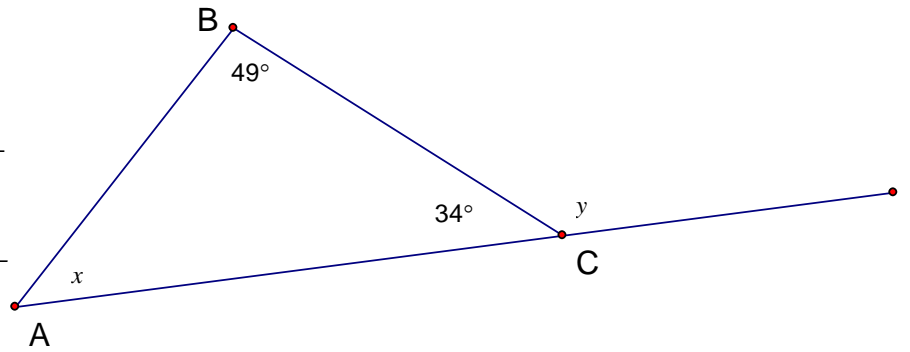
46. $\angle 4$ & $\angle 1$ _____



Find the measures of x and y .

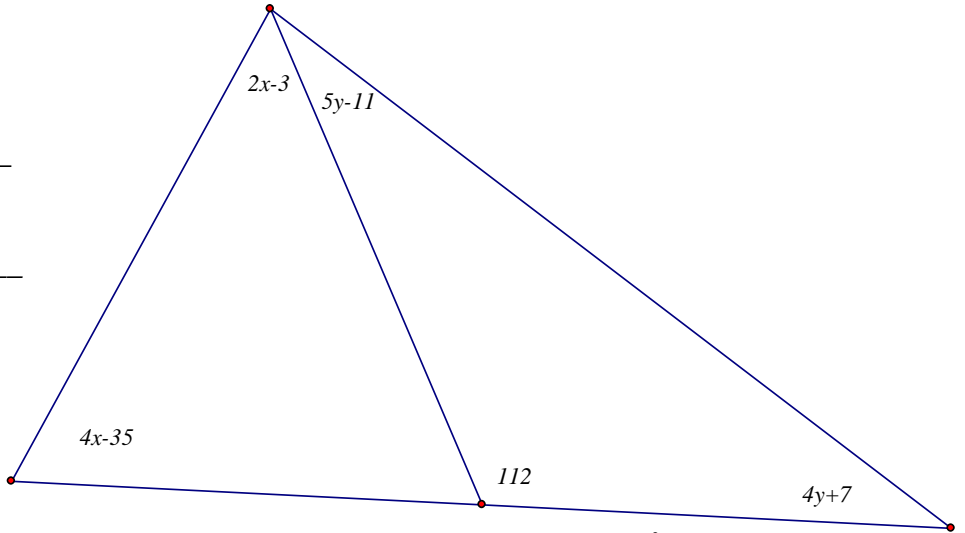
47. $x =$ _____

$y =$ _____

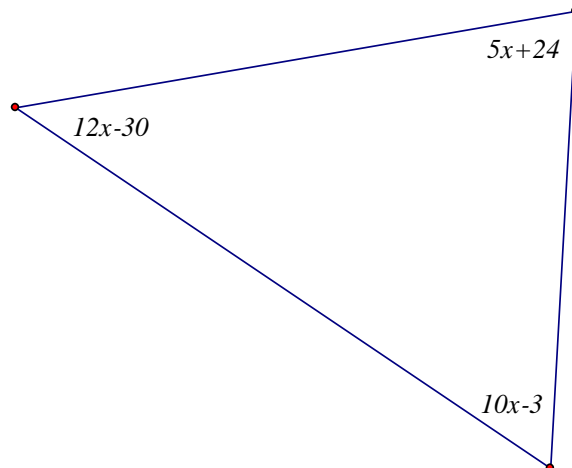


48. $x =$ _____

$y =$ _____



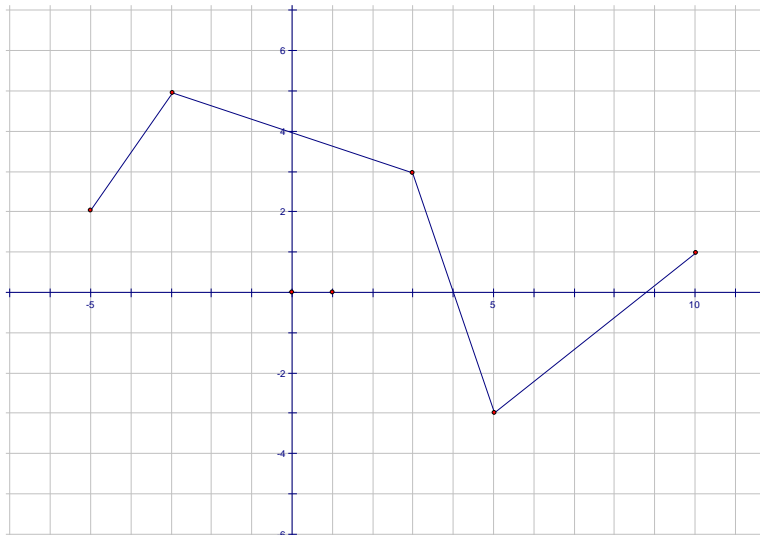
49. $x =$ _____



Name the domain and range for each function.

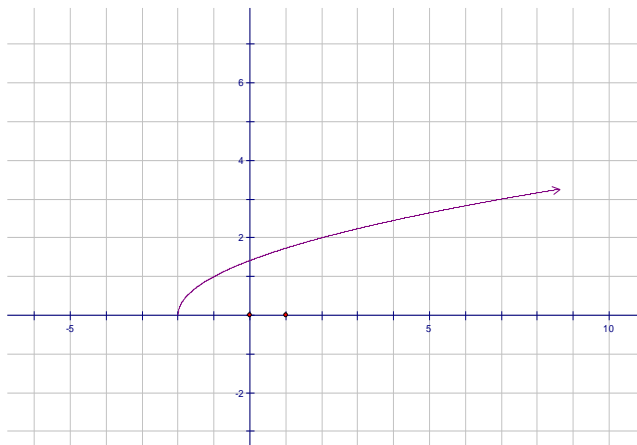
50. Domain:

Range:



51. Domain:

Range:



Radicals

Simplify. Show all work and circle your answers.

52. $4\sqrt{3} + 9\sqrt{3} - 7\sqrt{3}$

53. $14\sqrt{12} - 8\sqrt{75}$

54. $(-4\sqrt{18})(3\sqrt{5})$

55. $\sqrt{25} + \sqrt{75}$

56. $2x\sqrt{5x} \cdot 4x^2\sqrt{10x^5}$

57. $\frac{3\sqrt{45}}{\sqrt{3}}$

58. $\frac{-4\sqrt{60} \cdot 3\sqrt{10}}{6\sqrt{3}}$

59. $\frac{2\sqrt{5}}{\sqrt{2}}$

60. $\frac{4}{5\sqrt{24}}$

61. $\frac{12}{\sqrt{3}}$

62. $3\sqrt{10} \cdot 2\sqrt{15}$

63. $5\sqrt{27} - 3\sqrt{48} + 4\sqrt{12}$

64. $2\sqrt{2}(4 + \sqrt{64})$

65. $\sqrt{12} - 3 + \sqrt{27} + 11$

66. $(4 + \sqrt{2})(5 - \sqrt{2})$

67. $\frac{2x}{\sqrt{x}}$

68. $7\sqrt[3]{40} - 3\sqrt[3]{5}$

69. $\frac{4\sqrt{15}}{\sqrt{2}}$

70. $\sqrt{48} - \sqrt{75}$

71. $5\sqrt{18} + 9\sqrt{98}$

Systems of Equations

Solve. Define your variables, set up a system of equations, and solve.

72. The sum of Bridgid's age and her mother's age is 52. Bridgid's mother is 20 years older than Bridgid. How old is each?

73. Aparna is three times as old as Damian. In 10 years, Aparna will be twice as old as Damian. Find their present ages.

74. A two-digit number is 6 times its units digit. The sum of the digits is 6. Find the number.

75. The sum of the digits of a two-digit number is 12. The units digit is twice the tens digit. Find the number.

76. The units digit of a three-digit number is 5. The sum of its digits is 11. If the units and hundreds digits are reversed, the sum of the new number and the original number is 787. Find the original number.

77. The units digit of a two-digit number divided by the tens digit is 3. The sum of the digits is 12. Find the number.

78. A boat is rowed 10 miles downstream in two hours, then rowed the same distance upstream in $10/3$ hours. Find the rate of the boat in still water and the rate of the current.

79. How many pounds of candy that sells for 80 cents a pound should be mixed with candy that sells for \$1.50 a pound to make 20 pounds of a mixture to sell at \$1.01 a pound?
80. An airplane travels 1800 miles in 3 hours flying with the wind. On the return trip, flying against the wind, it takes 4 hours to travel 20000 miles. Find the rate of the wind and the rate of the plane in still air.
81. Amy broke open her “piggy bank” and found 83 coins in nickels and dimes. If she had \$6.95 in all, how many coins of each does she have?
82. While driving to Northridge, Mrs. Lockwood averages 40 mph. On the return trip she averages 56 mph and saves two hours of traveling time. How far from Northridge does she live?
83. Rodrigo invests \$4000, part of it at 10% annual interest and the rest at 12% annual interest. If he receives \$460 in interest at the end of one year, how much did he invest at each rate?
84. Ashwin has 500 mL of a 60% solution of silver nitrate. How many milliliters of 30% silver nitrate solution should be added to obtain a 50% solution?
85. Katherine has twice as many quarters as nickels and three more dimes than nickels. He has \$4.20 in all. How many of each coin does she have?
86. Andrew and Michael are 15 miles apart. If they walk towards each other, they meet in 3 hours. If they both walk in the same direction, Michael overtakes, Andrew in 8 hours. How fast does each boy walk?

Quadratics

Factor completely.

87. $x^2 - y^2$
88. $g^4 - 49$
89. $y^6 - 4$
90. $81x^2 - 64$
91. $36x^2 - 100y^8$

Identify the GCF for each set of numbers.

92. x^4, x^9, x^{16}
93. y^{15}, y, y^{11}
94. $x^2, 12x, 8x^3$
95. $24x^3y, 36x^2z, 48x^4y$
96. $25xy^2, 50x^3y^2, 75x^6y^2$

Factor using the GCF. If the polynomial cannot be factored, write the word, “prime,” as your answer.

97. $-2x - 8$

98. $2x - 8y + 4z$

99. $2x^2 - xy$

100. $-3z^2 - 6z + 9z^2$

101. $x^{10}y^8 - x^{12}y^6$

102. $-5z^2 - 6z$

103. $32x^4 - 16x + 48x^2$

104. $5z^2 - 6x + 9x^2$

FACTOR COMPLETELY. Write your answers in standard form.

105. $3x^5 - 16x$

106. $8x^2 - 4x + 12$

107. $-5x^3 + 10x - 20$

108. $8x^2 - 24$

109. $x^2 - 16x + 64$

110. $10x + 20y$

111. $x^4 - x^2 + 1$

112. $16 - y^2$

113. $4x^2y + 8xy - 12x$

114. $x^2 + 18x + 81$

115. $9x^2 - 6x^4 + 21x^3$

116. $x^{10} - 36$

117. $5x^4 - 25x^3 + 15x^2$

118. $6x^2 + 24x + 24$

119. $18x^2 + 98$

120. $16x^2 + 9$

Exponents/Scientific Notation

Simplify each expression.

$$121. (g^{14}h^{-12})(g^{-5}h^{14})$$

$$122. (4x^6)(-2x^{-3})$$

$$123. (5x^5y^{-9})(y^4)$$

$$124. \frac{x^{-3}y^2z}{xy^{-4}z^{-4}}$$

$$125. \frac{2^{-3}x^{-3}y^5}{2^{-4}y^5x^{-6}}$$

$$126. (-2x^2)^4$$

Simplify. Write your answers in scientific notation.

$$127. (3.0 \cdot 10^5)(8.2 \cdot 10^6)$$

$$128. (2.0 \cdot 10^{-4})(0.06 \cdot 10^{10})$$

$$129. (1.5 \cdot 10^9)(0.6 \cdot 10^4)$$

$$130. \frac{(63 \cdot 10^{17})}{(0.9 \cdot 10^{10})}$$

$$131. \frac{(6.0 \cdot 10^3)}{(1.5 \cdot 10^{-9})}$$

$$132. (400,000,000,000)(0.0025)$$

$$133. (3.4 \cdot 10^9) + (5.0 \cdot 10^7)$$

$$134. (3.4 \cdot 10^{15})(1.0 \cdot 10^{-5})(2.0 \cdot 10^{-2})$$

Distance Formula, Midpoint, Pythagorean Theorem

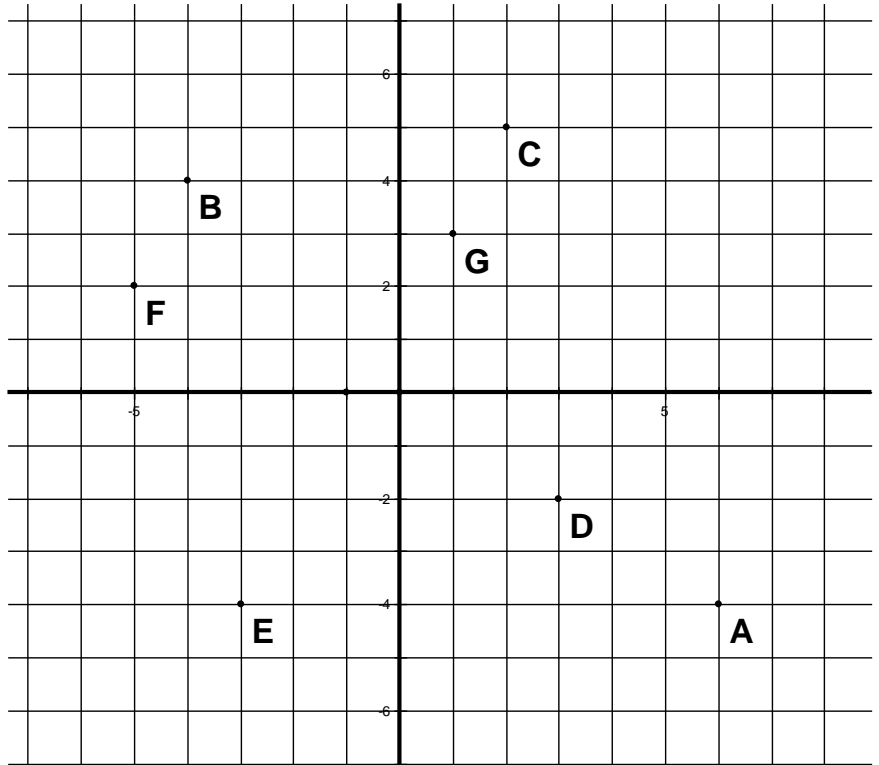
NO DECIMALS. ALL ANSWERS TO ALL PROBLEMS MUST BE SIMPLIFIED FRACTIONS OR RADICALS.

Find the distance between the indicated points using the graph. All answers should be simplified fractions/radicals. Show all work. NO DECIMALS.

135.A & C

136.G & E

137. B & D



Use the Pythagorean Theorem to determine if the following could be the side lengths of a right triangle.

138. 5, 7, 10 _____

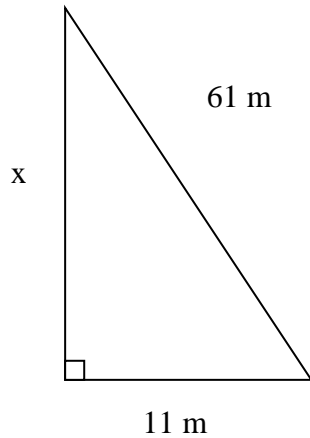
139. 9, 12, 15 _____

140. 10, 15, 8 _____

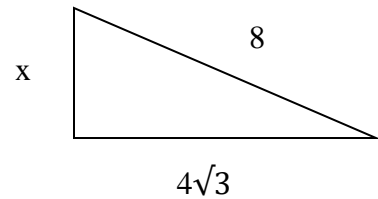
141. $2\sqrt{7}$, $5\sqrt{2}$, $10\sqrt{14}$ _____

Find the missing length. Simplify. Do not give a decimal answer. Show your work.

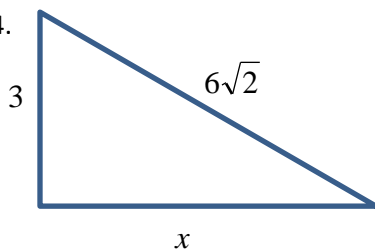
142.



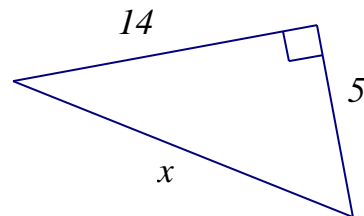
143.



144.



145.

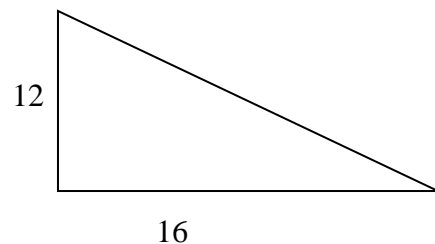


146. Find the length of a diagonal of a rectangle whose dimensions are 56 inches by 33 inches.

147. A train travels 60 miles due west. It then travels due south 90 miles. How far is the train from its starting point?

148. You are locked out of your house and the only open window is on the second floor, 25 feet above the ground. You need to borrow a ladder from one of your neighbors. There's a bush along the edge of the house, so you'll have to place the ladder 10 feet from the house. What length of ladder do you need to reach the window? (HINT: Draw a picture!)

149. What is the length of the hypotenuse?



150. A helicopter rose 300 feet in the air and flew west. If it is 900 feet from the starting point, how far west of the starting point is it?

Find the distance between the two points.

151. $(5, -9)$ & $(-6, -7)$

152. $(-5, -1)$ & $(0, 11)$

153. $(-3,-9)$ & $(-12,6)$

154. $(14,8)$ & $(9,7)$

Answer the following questions. Leave all answers as simplified fractions, radicals or in terms of pi.

155. If the volume of a cylinder is $640\pi \text{ in}^3$ and the height is 10 in, what is the radius of the base of the cylinder?

156. The volume of a cone is $405\pi \text{ cm}^3$. If the height of the cone is 15 cm, what is the radius of the cone?

157. The volume of a sphere is $288\pi \text{ in}^3$. What is the radius of the sphere?

Find the Surface Area and Volume. Leave your answers in exact form. NO DECIMALS.

158. Surface Area: _____

159. Surface Area: _____

Volume: _____

Volume: _____

