Accelerated Math II Summer Review Packet

DUE THE FIRST DAY OF SCHOOL

The problems in this packet are designed to help you review topics from previous mathematics courses that are essential to your success in Accelerated Math III. **You are expected to bring this completed packet to class on the first day of school.** In addition, this packet will count as part of your first quarter grade. **Upon returning, you will be ASSESSED on the content of this packet**. All contents outlined in the packet are Integrated Math I objectives. Neatly **SHOW YOUR WORK** on a separate sheet of paper.

1. Which ordered pair is a solution of the linear system?

$4x + 3y = 5$
$-2x + 5y = 17$

2. If $4y = x + 13$ and $x + 2y = 5$, then $x + y =$?

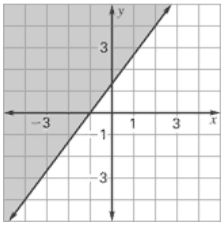
3. Your teacher is giving a test worth 200 points. There is a total of 30 five-point and ten-point questions. How many five-point questions are on the test?

4. Solve the linear system.

$-4x + 5y = 0$
$3x + 2y = 23$

5. You are at a used book sale. Softcovers are \$0.75 each and hardcovers are \$1.50 each. If you have \$6 to spend and you buy four softcovers, how many hardcovers can you buy at most?

6. Determine the inequality equation whose solution is shown in the graph.



Compare the value of A to B

7.

Column A	Column B
ean of 28, 16, 22, 13, 26	ean of 24, 10, 24, 30, 17

8.

Column A	Column B
x when $7x - 5 = 12$	3

9.

Column A	Column B
$(2x + 3y)^2$ when $x = 5$ and $y = -4$	$(2x)^2 + (3y)^2$ when $x = 5$ and $y = -4$

10. Solve the equation $\frac{2}{3}x + 5 = 13$.

11. Find the value of x if $6(2 - x) + 4x = -5(x + 3)$.

12. What is the value of $\frac{a - 2b + 3}{5}$ when $a = 3$ and $b = -4$?

13. What is the x-coordinate of the vertex for the graph of the equation $y = \frac{2}{3}x^2 - 6x + 4$?

Compare the value of A to B

14.

Column A	Column B
x in $x^2 + 4 = 13$	x in $x^2 + 3 = 19$

15. What is the value of $(4x)^2 + 3$ when $x = 3$?

16. What is a solution of the inequality $6x - 47 > 43 - 4x$?

17. Simplify $\left(7x^3 - 3x^2 + 5x - 5\right) + \left(5x^2 - 8x - 3\right)$?

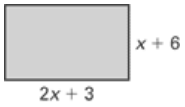
18. Simplify $(3x + 7)^2$?

19. Simplify $a^4 + 3a^2 - (5a - 3)(-7a)$.

20. A triangle's base is 14 inches less than 2 times its height. If *h* represents the height in inches, and the total area of the triangle is 54 square inches, write an equation can be used to determine the height?

21. Find the product $(x-6)(x+4)$.

22. Determine an expression that gives the area of the rectangle



23. Write as the product of two factors: $x^2 + 3x - 40$

Factor the expression.

24. $49x^2 - 16$

Solve for *x*.

25. $3x^2 = 147$

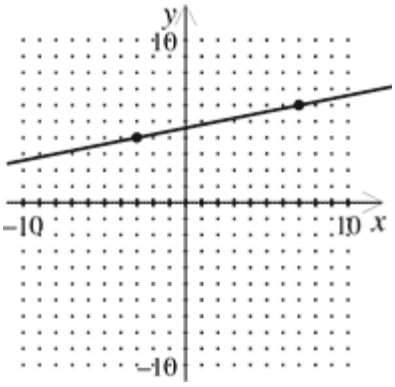
Solve by completing the square.

26. $9x^2 + 54x = 18$

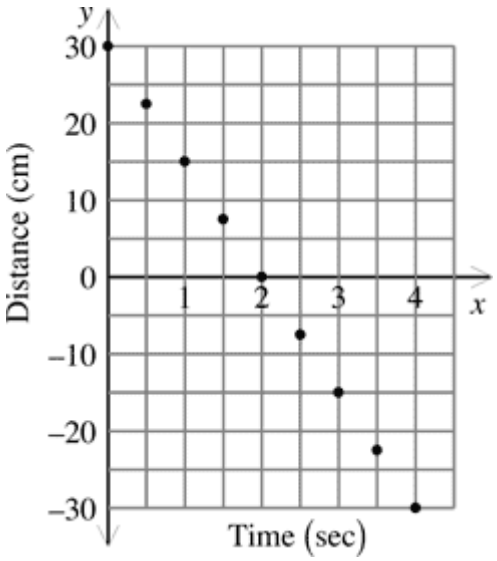
27. Use the quadratic formula to solve:
$2x^2 + 5x - 1 = 0$

28. A rock is thrown from the top of a tall building. The distance, in feet, between the rock and the ground *t* seconds after it is thrown is given by $d = -16t^2 - 2t + 733$. How long after the rock is thrown is it 400 feet from the ground?

29. Find the slope of the line.

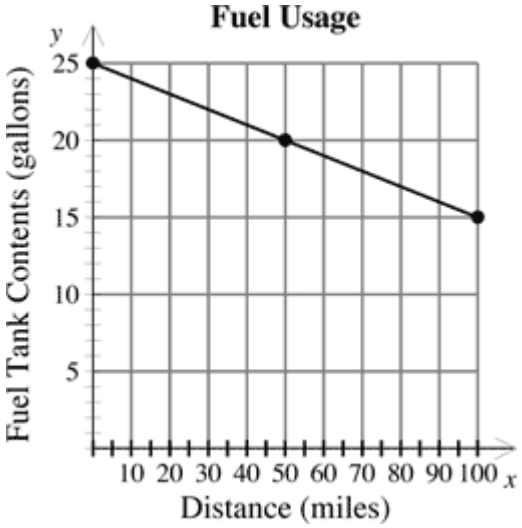


30. The graph below shows the position of a cart moving in a straight line in a physics experiment. The origin represents the location of a sensor that recorded the data, while *x* represents time in seconds and *y* represents the distance between the cart and the sensor. Negative *y*-values represent distances to the left of the sensor and positive *y*-values represent distances to the right of the sensor.



What information is given by the slope of the graph?

31. The graph shows the contents of the fuel tank of a truck as it travels down an interstate freeway.



What information is given by the graph?

32. The pulse rates of students before physical education class are recorded in the table.

Pulse Rate	68	69	70	71	72	73	74	75	76	77
Number of Students	4	1	5	2	0	3	3	2	3	3

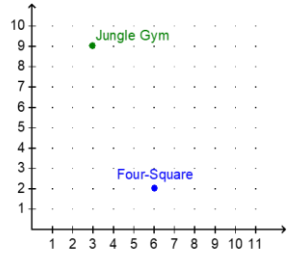
What is the mode for the pulse rates?

Copy and complete.

33. $(-5+1)+-4=-5+\left[1+(-4)\right]$ is an example of the _____ property.

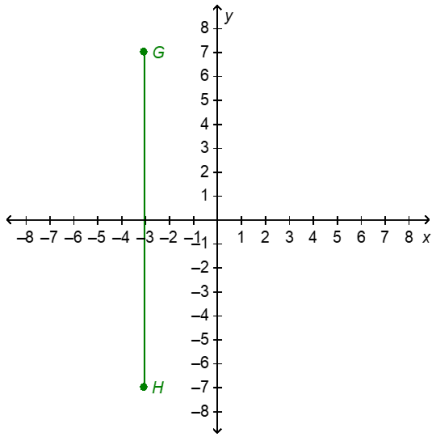
34. $-3.4 \cdot 9 = 9 \cdot -3.4$ is an example of the _____ property.

35. Kelly is drawing a map of the recess area at her school on a coordinate grid. If the scale of the map is 1 grid = 4 feet, what is the distance from the jungle gym to the four-square courts? Round your answer to the nearest tenth if necessary.

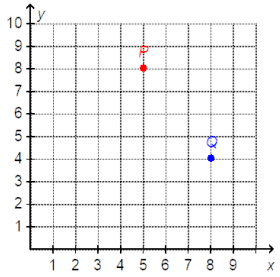


The formula for the midpoint between two points $(x_1, y_1), (x_2, y_2)$ ***is*** $\left(\frac{(x_1+x_2)}{2}, \frac{(y_1+y_2)}{2}\right)$.

36. Segment $\overline{GH}$ has endpoints *G*(–3, 7) and *H*(–3, –7). What are the coordinates of the midpoint of $\overline{GH}$?



37. Points *P* and *Q* on the coordinate grid below represent the locations of two observers for a science project.



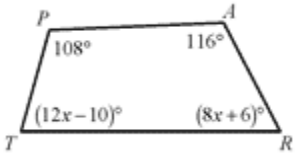
If the two observers both want to be the same distance from the science project, and as close as possible to it, what point best represents the location for them to put the science project?

38. The scores for the 33 participants in a fund-raising golf tournament are represented in the graph below. In which interval is the median score found?

39. The data {1, 5, 8, 5, 1} represent a random sample of the number of days absent from school for five students at Monta Vista High. Find the mean and the standard deviation of the data.

Find the value of *x* and the unknown angle measures.

40.



41. Which of the following shows a reflection of the triangle over the horizontal axis?

Name the type of transformation modeled by the action.

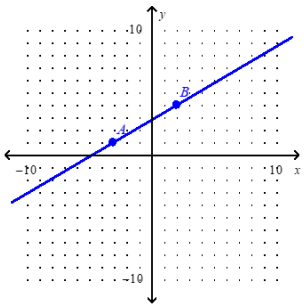
42. walking down stairs

43. riding a Ferris wheel

44. ΔTUV has vertices $T(0, -2)$, $U(4, 4)$, and $V(2, -5)$. Find the vertices of its image after the translation $(x, y) \rightarrow (x - 4, y + 2)$.

45. Suppose a constellation of stars is plotted on a coordinate plane. The coordinates of the first star are at (5, –8). The star is translated down 9 units. What are its new coordinates? Describe its translation. Find the slope of the line.

46.



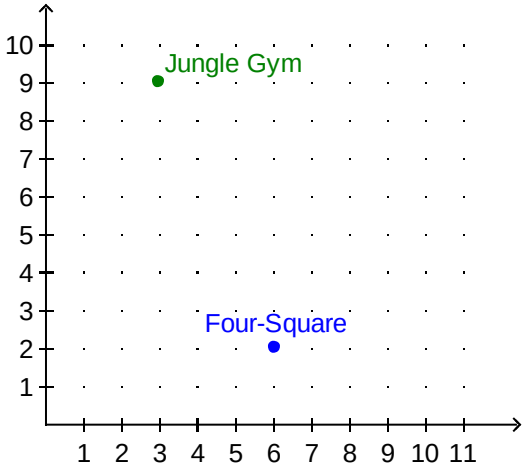
Find the slope of the line passing through the points.

47. $(8, 6)$, $(3, -6)$

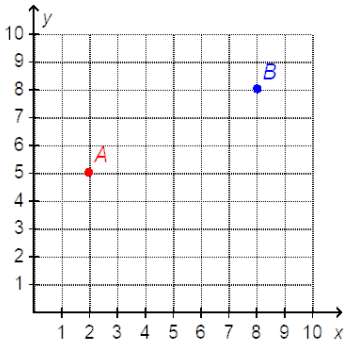
Find the slope of the line passing through the points.

48. $(-9, -2)$, $(-9, -9)$

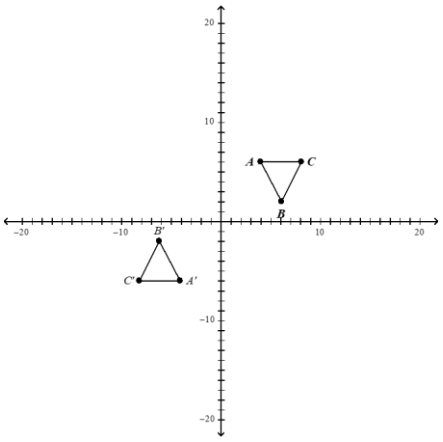
49. Kelly is drawing a map of the recess area at her school on a coordinate grid. If the scale of the map is 1 grid = 4 feet, what is the distance from the jungle gym to the four-square courts? Round your answer to the nearest tenth if necessary.



50. What is the distance from Point *A* to Point *B*? Round your answer to the nearest tenth if necessary. (Hint: sketch a right triangle and use the Pythagorean theorem.)



51. Use coordinate notation to describe the transformation from figure *ABC* to figure $A'B'C'$.



Graph ΔDEF with vertices $D(0, 3), E(4, 3)$, and $F(0, 7)$. Then graph its image after the given transformation.

52. Translate using $(x, y) \rightarrow (x - 4, y - 5)$.

53. Rotate 180°. Then translate using $(x, y) \rightarrow (x - 1, y - 1)$.

54. Rotate 90° counterclockwise 3 times.

55. Translate using $(x, y) \rightarrow (x, y + 2)$. Then rotate 180°.

56. Which of the following shows a reflection of the triangle over the horizontal axis?

Graph the polygon and its reflection in the given axis.

57. $S(-7, 2)$, $T(-2, 2)$, $U(-6, 7)$; *y*-axis

58. $J(-5, 0), K(-3, -3), L(0, 0), M(-3, 3)$; *y*-axis

Evaluate.

59. $4[(29 - 12) + 10]$

60. $-9.1 - |-7.5|$

61. $(-14)(-2)$

62. $\sqrt{169}$

63. $\left|\frac{2}{3} - (-\frac{1}{2}) + \frac{1}{3}\right|$

64. $\left(-\frac{4}{3}\right)\left(-\frac{6}{7}\right)\left(\frac{2}{3}\right)\left(\frac{14}{15}\right)$

Check whether the given number is a solution of the equation or inequality.

65. $10x - 4 \le 20$; 5

66. $4x - 3x = \frac{9}{x}$; 3

Simplify.

67. $(-4)(-x)$

68. $(-8y)(3y - 4) + 6y - 5$

Evaluate the expression for the given values of the variables.

69. $4 + x + (-7) + (-3)$ when $x = 3$

70. $3x^2 - x + 5$ when $x = -3$

71. $|6x - 3y|$ when $x = \frac{2}{3}$ and $y = \frac{5}{6}$

Solve the equation.

72. $40 - 14y = 6y$

73. $8x - 10(3 - x) = 42$

74. Temperature Conversion: $F = \frac{9}{5}C + 32$

Solve for *C*.

75. $-\frac{5}{6}b = -20$

76. $-\frac{4}{5}(5x-10) = 16$

77. $5(2-x)+7x = -3(x+5)$

78. $\frac{2}{3}(18x-12) = 7-3(x-3)$

79. Annual Interest Rate: $A = P + Prt$
Solve for *r*.

Rewrite the equation so that *y* is a function of *x*.

80. $4(2x-3y) = -5(x+3y)$

Graph and check to solve the linear system.

81. $x = 4$
$y = 2$

Graph the system of linear inequalities.

82. $y < x+1$
$y \geq 3$

83. $y > \frac{3}{4}x + \frac{5}{4}$
$y \leq -3x + \frac{5}{2}$

Solve the system using the method of your choice and tell how many solutions the system has.

84. $2x + y = 5$
$3y = 4x - 5$

Use for #85 & 86. Match the system of linear inequalities with its graph.

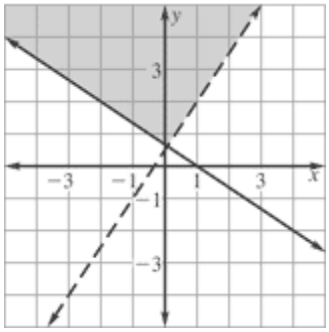
$x + 3y < 2$
$3x + 2y \leq -2$

$x + 3y < 8$
$3x + 2y \leq 1$

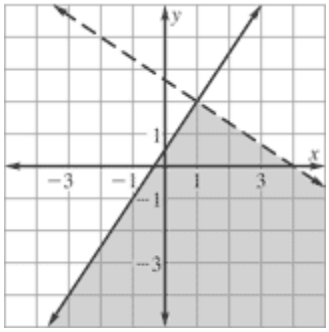
$3x + 2y > 1$
$x + 3y \geq 2$

$x + 3y \geq 8$
$3x + 2y > -3$

85.



86.



Solve the linear system using elimination.

87. $3y = 16 - 2x$
$3x + 2y = 14$

Solve the equation by completing the square.

88. $x^2 + 8x = 14$

Solve the equation.

89. $a-(-4)=-35$

Evaluate.

90. $-|-14|$

91. $-15+10+(-5.0)$

92. $z^2-7\cdot 8$ when $z=10$.

93. Sketch the graph of $y=-x^2+4x$. Label the vertex and *x*-intercepts.

94. Tell whether the graph of $y=-x^2-4x-1$ opens up or down. Find the coordinates of the vertex. Write the equation of the axis of symmetry of the function.

Calculate.

95. Find the average speed of a car that travels 135 miles in 2.5 hours.

96. Solve the linear system and tell how many solutions the system has.

$y=6x+5$

$6x-y=7$

Simplify.

97. Simplify the expression $3x+7x(x+2)$.

98. An awards dinner costs \$225 plus \$5 for each person making reservations. The total bill is \$735. How many people made reservations?

Classify the polynomial as a *monomial*, a *binomial*, or a *trinomial*.

99. $15a^2b$

Simplify the polynomial and write it in standard form.

100. $7x-9+4x$

101. $12-5m^2-2m^2+8m$

Subtract.

102.

$$\left(7y^3+4y^2-5y+3\right)-\left(8y^3-4y^2-2y+2\right)$$

Multiply.

103. $-3t^2\left(3t^2-4t+5\right)$

104. $(3a-5)(3a+5)$

105. Write $(m-4)^2$ as a trinomial.

106. You have a rectangular vegetable garden that is 10 feet long and 12 feet wide. You enlarge the garden by increasing each side length by *y* feet. Write a polynomial expression describing the area of the larger garden.

Add.

107. $\left(3n-4n^2+7\right)+\left(7n^2+5n-6\right)$

108. **Multi-Step Problem** You open a business making and selling bookcases. It is determined that the cost for producing *x* bookcases is given by the function $f(x)=155+48x$. Each of the bookcases is sold for \$79.

a. Is the expression $155+48x$ a *monomial*, *binomial* or *trinomial*?

b. The *revenue* for selling *x* bookcases refers to the amount of money earned if *x* bookcases are sold. The revenue function is given by $f(x)=79x$. Find the revenue if 21 bookcases are sold.

c. Your *profit* is given by the difference of the revenue and cost functions. Write and simplify an expression for your profit. Then write a function for the profit.

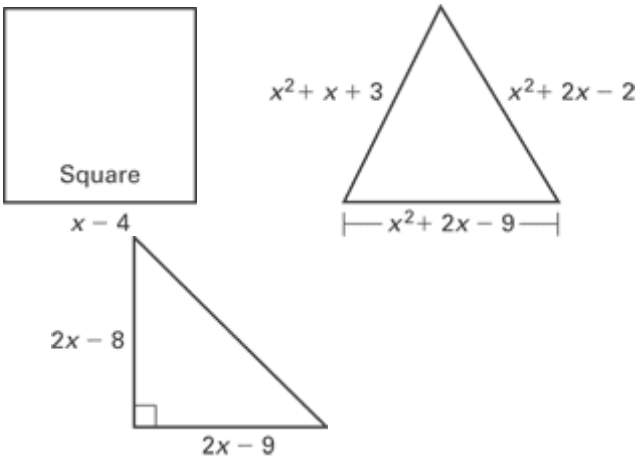
d. Find the profit you make for selling 21 bookcases.

e. The break-even point occurs when the profit equals zero. How many bookcases need to be produced and sold to reach the break-even point?

f. Last week you made and sold 80 bookcases. If you make and sell 100 bookcases this week, how much will this week's profit increase over last week's profit?

g. If you know that the cost of producing x tables is $(50x + 75)$ and you wish to produce $(2x + 10)$ of these tables, there is a total cost of $(50x + 75)(2x + 10)$. Find this product.

109. **MULTI-STEP PROBLEM** Use the figures to answer the questions.



Solve all quadratic equations by **factoring.**

a. Write an expression for the perimeter of Figure 1 and for the perimeter of Figure 2.

b. Find the perimeter of Figure 1 if $x = 5$ centimeters and if $x = 3$ centimeters, if possible. If not possible, explain why not.

c. Write and simplify an expression for the area of Figure 1 and for the area of Figure 3.

d. Find the area of Figure 3 if $x = 10$ centimeters.

110. Solve by factoring: $x^2 - 18x + 81 = 0$

Factor the expression.

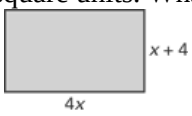
111. $5x^2 - 42x + 16$

Solve.

112. $4x^2 - 12x - 16 = 0$

113. Solve the equation by completing the square. $x^2 + 2x - 24 = 0$

114. The area of the rectangle shown is 84 square units. What is the value of x?



115. Use the quadratic formula to solve the equation. $3x^2 + x - 1 = 0$

116. Find the slope of the line passing through (–11, 7) and (–6, 10).

117. Line 1 contains (2, 4) and (0, –2). Line 2 contains (–1, –3) and (1, 3). Are the lines parallel, perpendicular, or neither?

118. Which equation has the steeper graph, $y = \frac{7}{4}x + 5$ or $y = \frac{5}{3}x - 2$?

The three points are vertices of a triangle. Find the slope of each side of the triangle.

119. $A(3, 3), B(0, 1), C(-3, 5)$

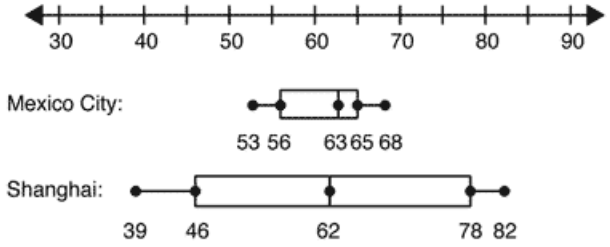
120. $A(3, 3), B(0, 1), C(-3, 5)$

Find the slope and y-intercept of the graph of the equation.

121. $y = 4 - 2x$

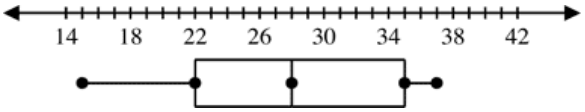
122. Draw a box-and-whisker plot of the data.
24, 15, 19, 20, 27, 24, 19, 40, 28, 37, 25, 17, 19, 32, 22

The box-and-whisker plots below show the average monthly temperatures for Mexico City, Mexico, and Shanghai, China, in degrees Fahrenheit.



123. Which city has a higher median temperature?

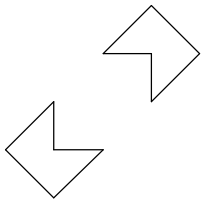
124. Use the box-and-whisker plot below. Identify the lower extreme, upper extreme, and median.



True or False:

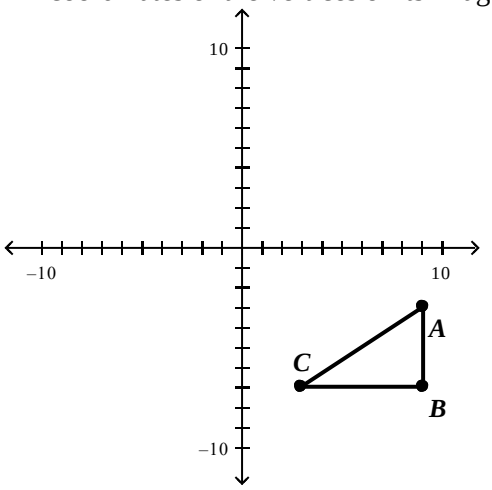
125. A parallelogram is never a rhombus.

126. Does the picture show a reflection?



127. Graph the triangle with vertices (–8, 2), (–3, 2), and (–5, 6). Then graph its reflection in the *x*-axis.

128. Reflect ΔABC over the x-axis. Write the coordinates of the vertices of its image.



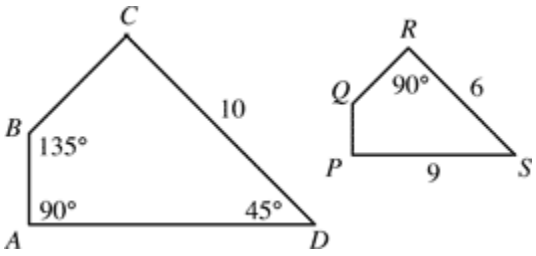
129. Graph ΔPQR with vertices $P(9, -2)$, $Q(8, 7)$, and $R(5, -1)$. Then graph its image after the transformation $(x, y) \rightarrow (x - 12, y - 8)$

For each pair of coordinates, describe the translation in two ways, one using only addition and one using only subtraction. Then show each translation on a graph.

130.

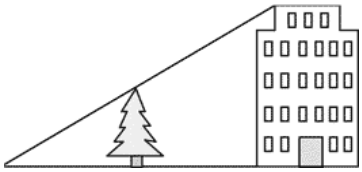
	Original	Image
a.	$D(2, 5)$	$D'(5, 2)$
b.	$E(-3, 6)$	$E'(3, 7)$
c.	$F(-2, -5)$	$F'(-5, -9)$

Use the similar figures *ABCD* and *PQRS* to answer the question.

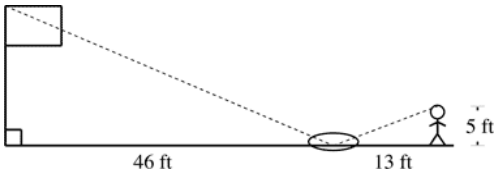


131. a. Find the ratio of the corresponding side lengths.
b. Use the ratio to find *AD*.

132. Moody wants to find the height of the tallest building in his city. He stands 460 feet away from the building. There is a tree 42 feet in front of him, which he knows is 23 feet tall. How tall is the building? (Round to the nearest foot.)

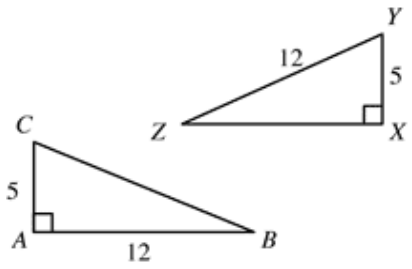


133. Karen wanted to measure the height of her school's flagpole. She placed a mirror on the ground 46 feet from the flagpole, and then walked backwards until she was able to see the top of the pole in the mirror. Her eyes were 5 feet above the ground and she was 13 feet from the mirror. Using similar triangles, find the height of the flagpole to the nearest hundredth of a foot. (Figures may not be drawn to scale.)

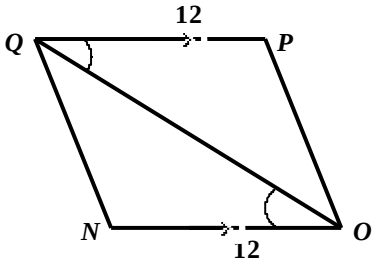


Tell whether the triangles in each pair are congruent. Explain.

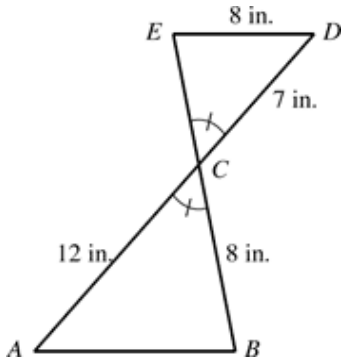
134. $\Delta ABC,\ \Delta XYZ$



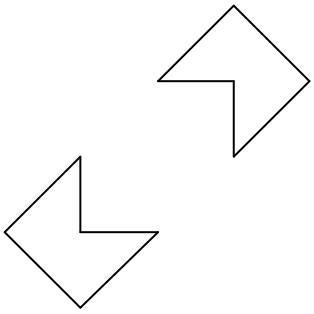
135. $\Delta QNO,\ \Delta OPQ$



136. Tell whether ΔABC and ΔDEC are congruent. Explain how you know.



137. Does the picture show a reflection?



138. Graph the triangle with vertices (–8, 2), (–3, 2), and (–5, 6). Then graph its reflection in the *x*-axis.

Write the area formula for the figure.

139. triangle

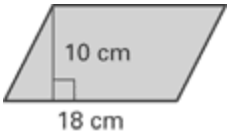
140. circle

141. parallelogram

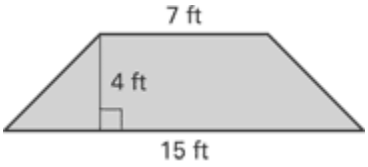
142. trapezoid

Find the area of the figure. Use 3.14 for π.

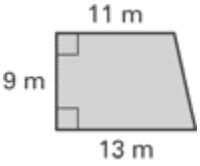
143.



144.



145.



146.

Find the radius of the circle with the given area. Use 3.14 for π.

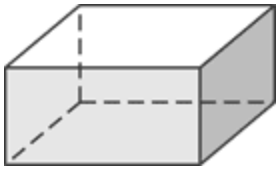
147. $A = 50.24 \text{ ft}^2$

148. $A = 530.66 \text{ m}^2$

Classify the solid. Then tell whether it is a polyhedron.

149.

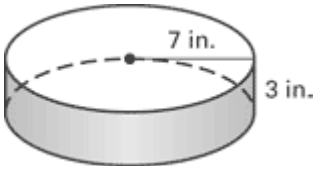
150.



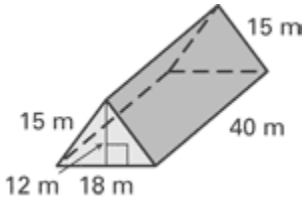
151. Show two ways to represent a triangular prism. Then count the number of faces, edges, and vertices.

Draw a net for the solid. Then find the surface area of the solid.

152.



153.

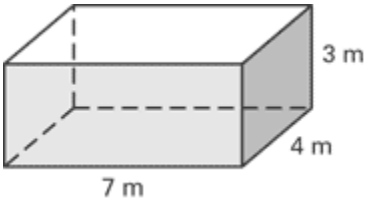


154. Find the surface area of a cone with a radius of 7 inches and a slant height of 11 inches.

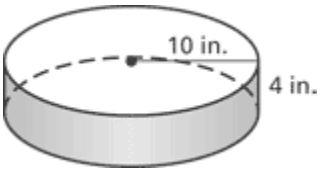
155. A home economics teacher is ordering fabric for the next sewing project. Each student will be making a pillow that is cylindrical, with a diameter of 8 inches and a length of 14 inches. How many square inches of fabric will be used for each pillow?

Find the volume of the solid.

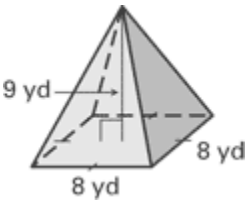
156.



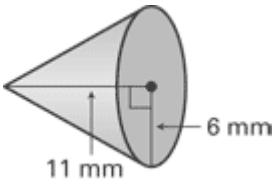
157.



158.



159.



160. Wax cylinder records were used to record music in the late 1800s. A wax record was a 4-inch long hollow cylinder with a 2-inch diameter. Music was recorded on grooves around the outside of the curved surface of the cylinder. Make a sketch and find the area of the curved recording surface.

161. Find the surface area and volume of a cube with sides of 4 centimeters. Then double the side lengths and find the surface area and volume. Write a ratio of the original surface area to the new surface area, and the original volume to the new volume. Simplify the ratios.

162. Jenny caught and released 10 fish at Blue Lake this season. The fish weighed 6 pounds, 3 pounds, 8 pounds, 3 pounds, 4 pounds, 2 pounds, 5 pounds, 3 pounds, 21 pounds, and 3 pounds.

Part A Find the mean, median, and mode of the weights. Show your work.

Part B Jenny wants to know what weight of fish she caught the most often. Which measure of central tendency provides this information?

Part C If Jenny wants to increase the mean to 6 pounds by catching one more fish, how much must the fish weigh? Show your work.

163. The height of ten students was measured in inches. The height of the girls is in set *A* and the height of the boys is in set *B*. Compare the spread of the data for the two sets using (**a**) the range and (**b**) the mean absolute deviation.

A: 62, 63, 64, 65, 68

B: 62, 64, 64, 65, 70

164. **Performance Task:** A set of quiz grades for two different classes is given in the table below.

Class 1	5	7	10	10	8	7	5	10	8	10
Class 2	8	9	8	6	8	10	8	7	9	7

a. Calculate the mean for each class. What does the mean tell you about each class?

b. Draw a histogram for each class. What does the histogram tell you about each class?

165. The nutritional information from a popular fast-food restaurant reported the following number of grams of fat in the sandwiches they offer: 9, 12, 23, 18, 25, 40, 30, 23, 26, 18, 16, 17, 9, 16, 22, 29, 13, and 20.

a. Plot a box-and-whisker plot for these data.

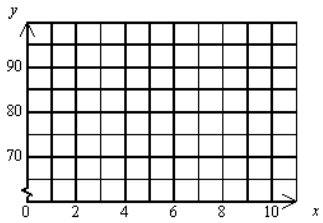
b. Are there any outliers in these data? How do you know?

166. This year the Wolverine basketball team scored the following number of points in its 10 games.

Game	1	2	3	4	5	6	7	8	9	10
Points	74	74	84	82	78	86	87	93	87	93

a. Make a scatter plot of the ten data points. Let x = the game number and y = the number of points scored during the game.

b. Find an equation for a line of fit. Graph the line on the scatter plot in part (a). Label the line.



Solve.

167. $(8x + 5)^2 = 63$

168. How would you translate the graph of $y = x^2$ to produce the graph of $y = x^2 + 10$?

169. The height of a triangle is three feet longer than the base. The area of the triangle is 35 square feet. Find the height and base of the triangle.

170. Consider the line that passes through the points (4, 6) and (7, 6).

a. Find the equation of the line through the points (4, 6) and (7, 6).

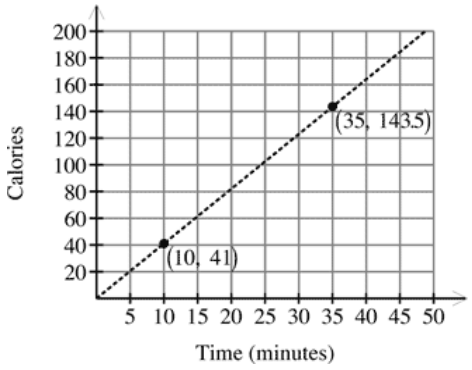
b. Find the equation of the line perpendicular to the line in part (a) at the point (7, 6). *Explain* why the slopes are not negative reciprocals.

The data represent the ages (in months) of a group of babies when they cut their first tooth.

5, 6, 7, 5, 8, 9, 7, 8, 9, 7, 6, 10, 8, 7, 5, 5, 6, 7, 4, 8

171. Make a data display that shows the numbers of babies that cut their first tooth during each of the ages listed. Explain why you chose that type of display.

172. The graph below shows the number of calories burned by a 155-pound person in 10 minutes of doing general house cleaning and in 35 minutes of doing general house cleaning.

Part A To the nearest tenth, what is the slope of the line joining the two points shown in the graph? Show your work.

Part B What does the slope represent?