

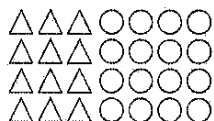
# SUMMER MATH PACKET



7th Grade to 8th Grade Math

Name: \_\_\_\_\_

1. Find the ratio of triangles to circles in the diagram below.

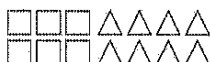


Unsimplified ratio of triangles to circles:

:

For every 3 triangles there are \_\_\_\_ circles, therefore the simplified ratio of triangles to circles is \_\_\_\_ : \_\_\_\_.

2. Find the ratio of squares to total shapes in the diagram below.



Unsimplified ratio of squares to total shapes:

:

For every 3 squares there are \_\_\_\_ total shapes, therefore the simplified ratio of squares to total shapes is \_\_\_\_ : \_\_\_\_.

3. Find the ratio of triangles to circles in the diagram below.



Unsimplified ratio of triangles to circles:

:

For every 3 triangles there are \_\_\_\_ circles, therefore the simplified ratio of triangles to circles is \_\_\_\_ : \_\_\_\_.

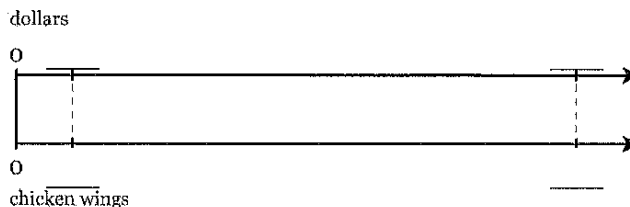
4. Find an equivalent ratio in simplest terms: 48 : 20

5. Find an equivalent ratio in simplest terms: 18 : 64

6. Find an equivalent ratio in simplest terms: 55 : 33

7. Isaiah earned \$237.00 at his job when he worked for 10 hours. How much money did he earn each hour?

8. Camden bought 22 chicken wings for \$24.20. What was the cost of the wings, in dollars per wing? On the double number line below, fill in the given values, then use multiplication or division to find the missing value.



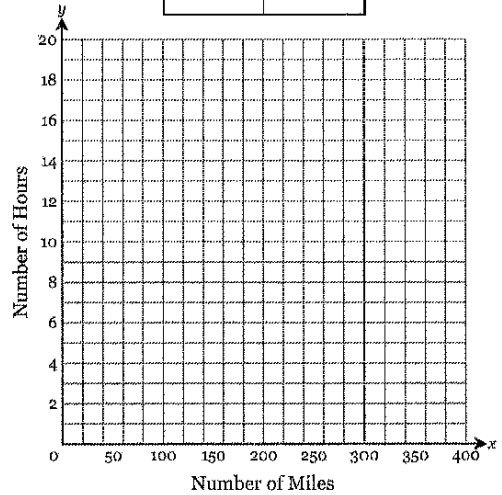
9. Josiah's car used 10 gallons to travel 250 miles. How far can he travel on 7 gallons?

10. Annabelle bought 20 chicken wings for \$32.00. If Annabelle spent \$17.60, how many chicken wings did she buy?

11. A grocery store sells a bag of 7 oranges for \$2.24. If Jaxon spent \$3.52 on oranges, how many did he buy?

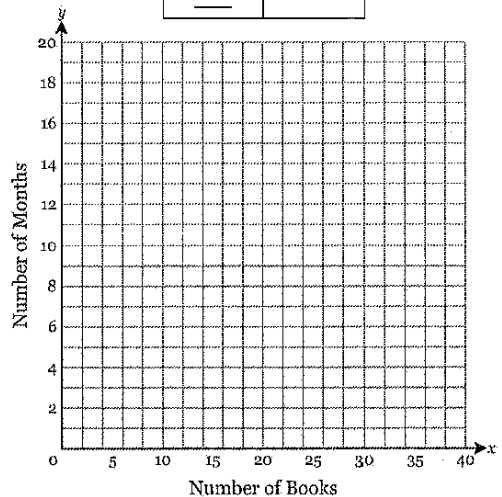
12. Aaliyah drove 381 miles in 6 hours. Fill out a table of equivalent ratios and plot the points on the coordinate axes provided.

Miles	Hours
127	___
___	4
381	6



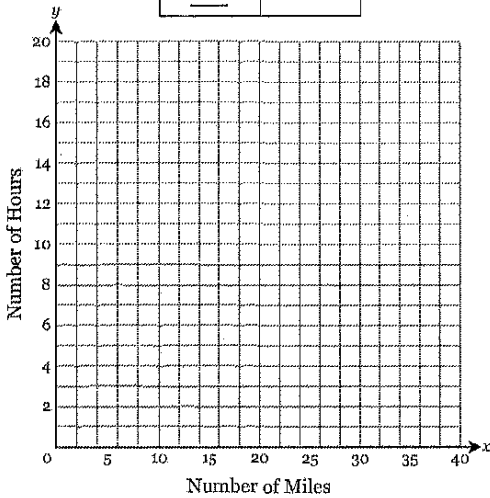
13. Enola read 9 books in 3 months. Fill out a table of equivalent ratios and plot the points on the coordinate axes provided.

Books	Months
3	___
9	3
___	8

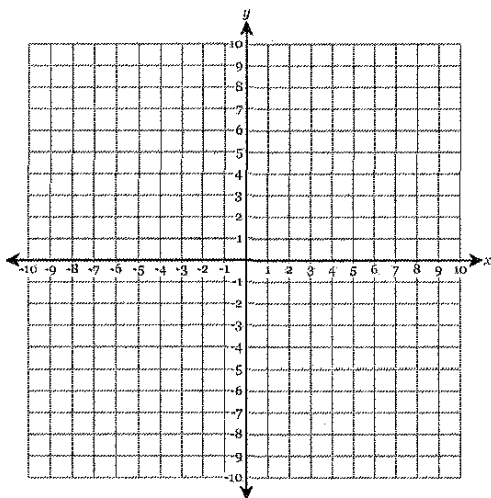


14. Aisha walked 6 miles in 4 hours. Fill out a table of equivalent ratios and plot the points on the coordinate axes provided.

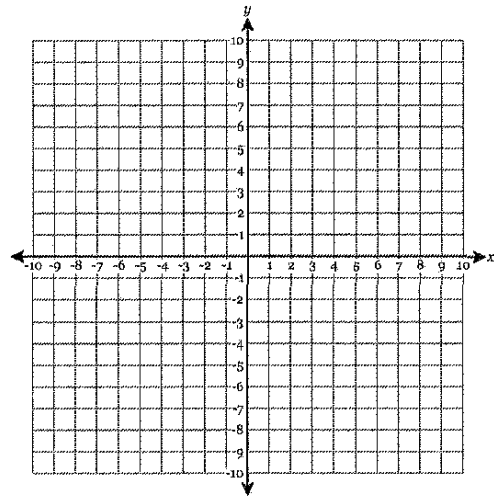
Miles	Hours
3	___
6	4
___	16



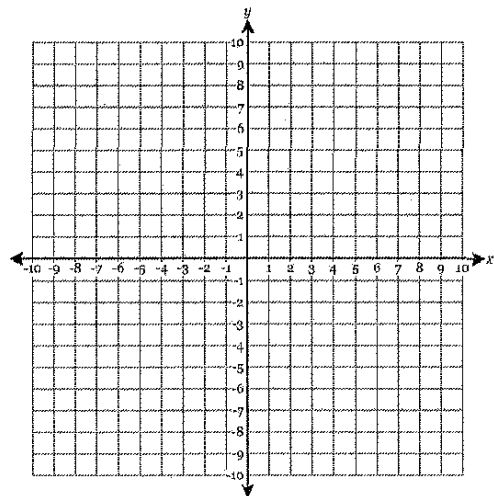
15. Plot the point  $(-4, -7)$ .



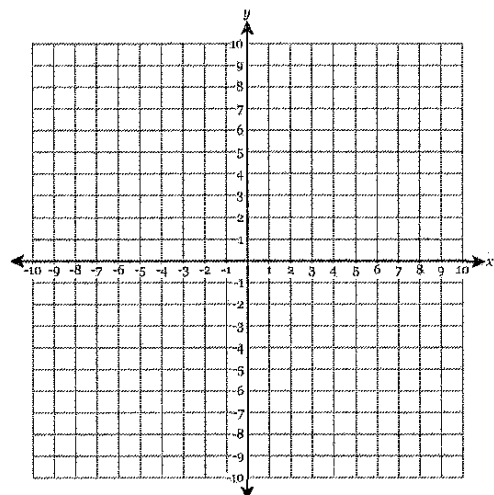
16. Plot the point  $(8, 2)$ .



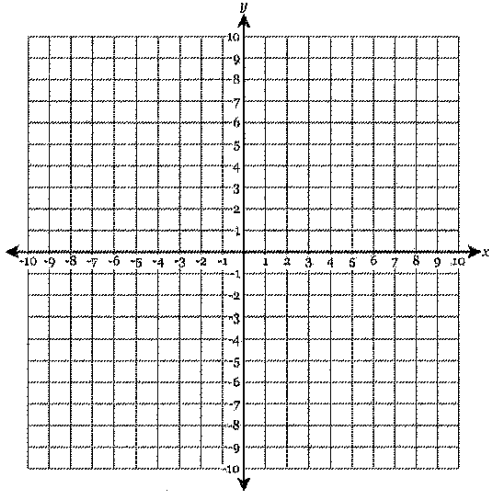
17. Plot the point  $(8, 1)$ .



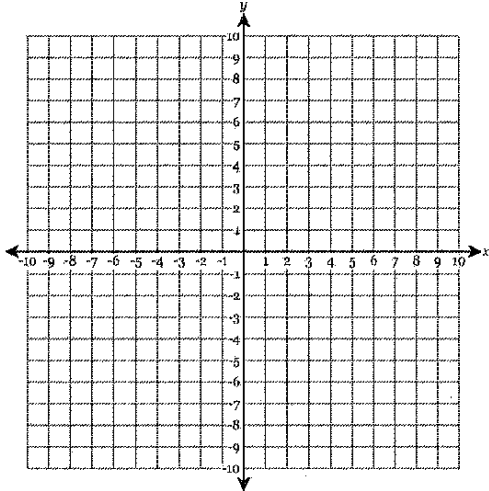
18. Plot the point  $(-1, 0)$ .



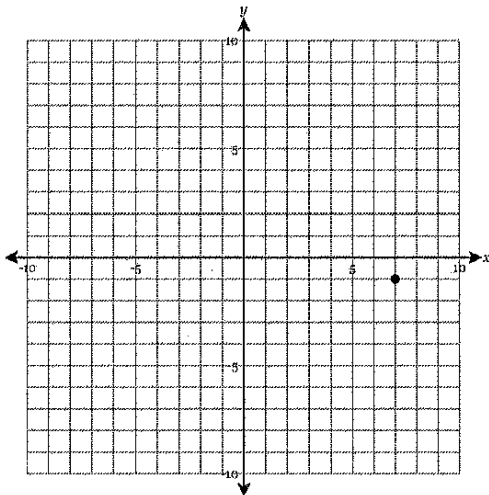
19. Plot the point  $(-1, -5)$ .



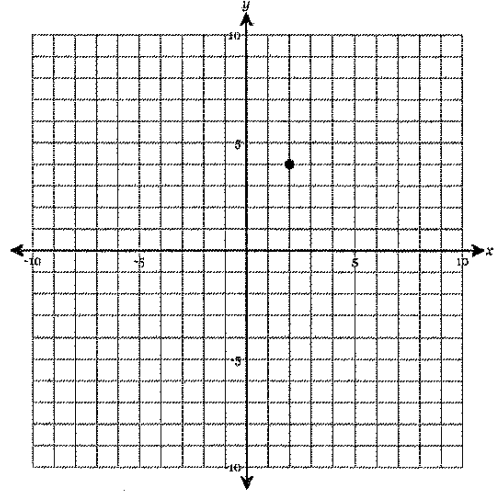
20. Plot the point  $(-3, 0)$ .



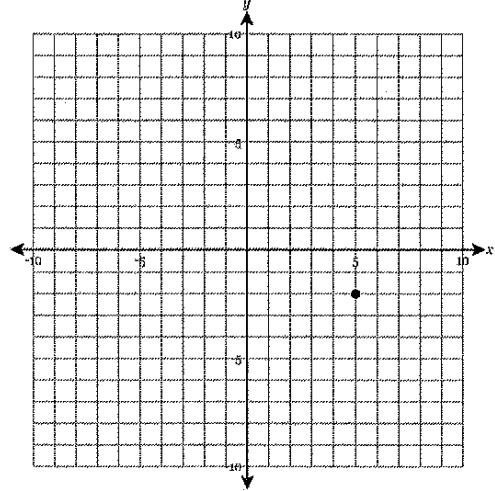
21. State the coordinates of the point.



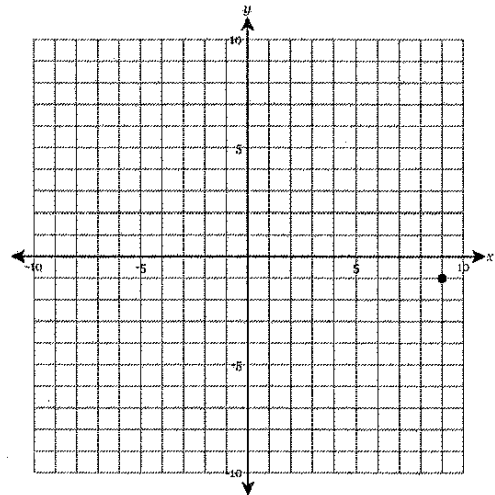
22. State the coordinates of the point.



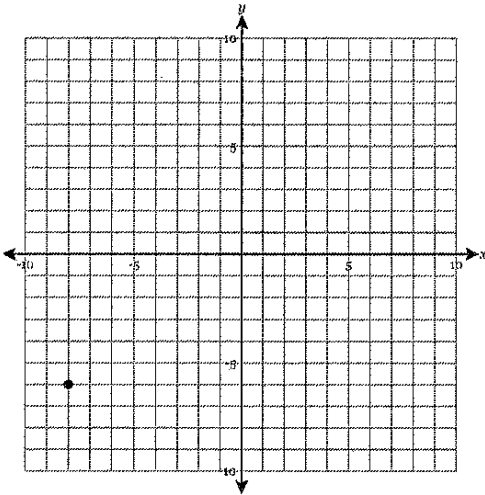
23. State the coordinates of the point.



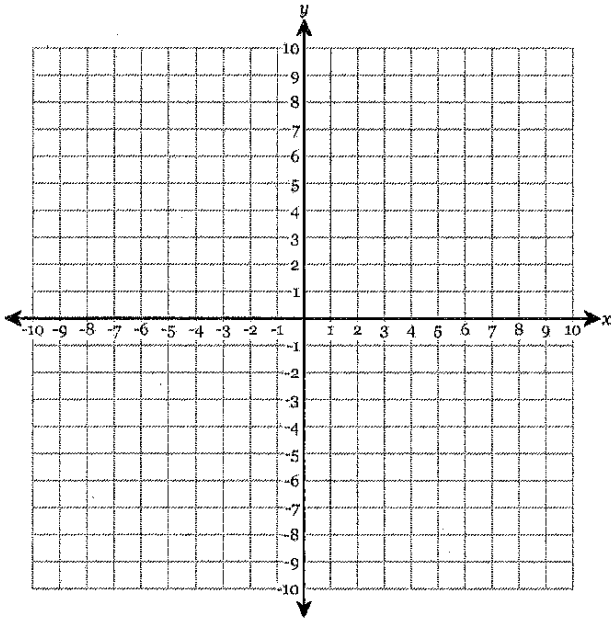
24. State the coordinates of the point.



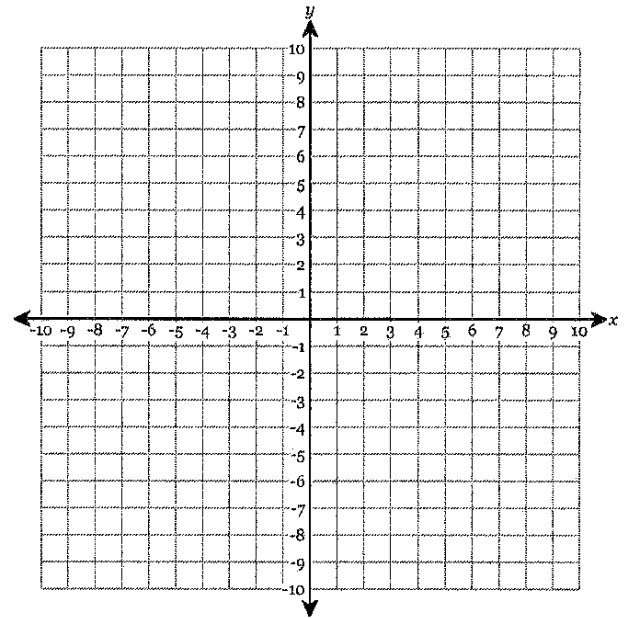
25. State the coordinates of the point.



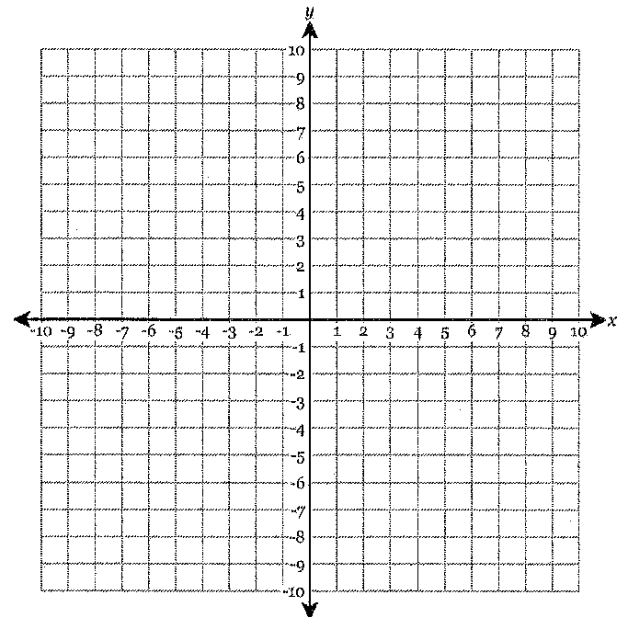
26. Plot the points  $(-2, -4)$  and  $(9, -4)$ . Then find the horizontal distance between them.



27. Plot the points  $(8, -8)$  and  $(8, 8)$ . Then find the vertical distance between them.



28. Plot the points  $(-4, 3)$  and  $(-8, 3)$ . Then find the horizontal distance between them.



29. The coordinates of the point  $P$  are  $(-8, -5)$  and the coordinates of point  $Q$  are  $(-8, -1)$ . What is the distance, in units, between the point  $P$  and point  $Q$ ?

30. The coordinates of the point  $D$  are  $(10, -6)$  and the coordinates of point  $E$  are  $(2, -6)$ . What is the distance, in units, between the point  $D$  and point  $E$ ?

31. A triangle has vertices on a coordinate grid at  $R(6, -8)$ ,  $S(6, 10)$ , and  $T(0, 10)$ . What is the length, in units, of  $\overline{RS}$ ?

32. In which quadrant does the point  $(-5, -4)$  lie?

- A. Quadrant 1
- B. Quadrant 2
- C. Quadrant 3
- D. Quadrant 4

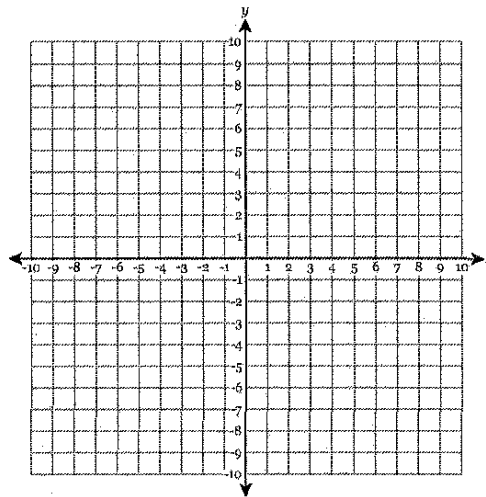
33. Select the point which lies in the third quadrant.

- A.  $(-2, 3)$
- B.  $(8, -1)$
- C.  $(-3, -5)$
- D.  $(3, 8)$

34. Select the point which lies in the first quadrant.

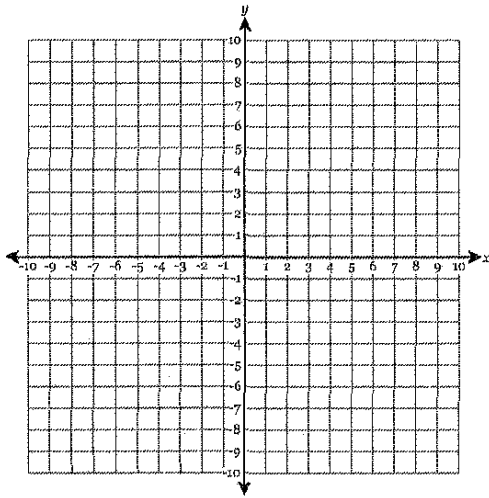
- A.  $(-7, 4)$
- B.  $(-7, -8)$
- C.  $(2, -7)$
- D.  $(7, 1)$

35. Plot and connect the points in the order listed below. When you are done, choose the word that best identifies the resulting shape/polygon.  $A(-1, -1)$ ,  $B(2, 3)$ ,  $C(6, 3)$



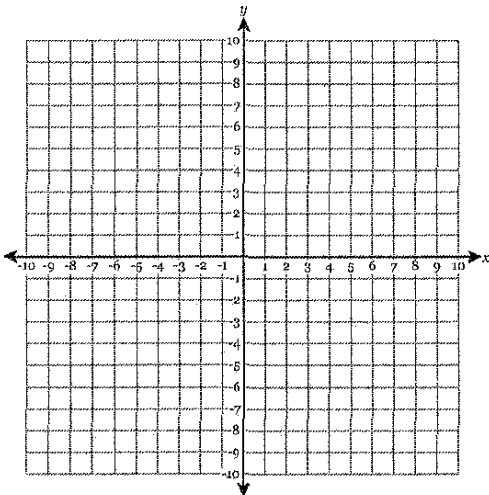
- A. Pentagon
- B. Triangle (Right)
- C. Triangle (Obtuse)
- D. Quadrilateral (Rectangle)
- E. Quadrilateral (Parallelogram)

36. Plot and connect the points in the order listed below. When you are done, choose the word that best identifies the resulting shape/polygon.  $A(-1, -5)$ ,  $B(2, 2)$ ,  $C(6, 2)$ ,  $D(3, -5)$



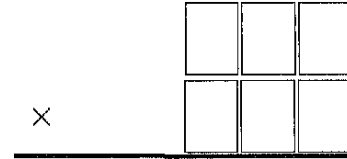
- A. Triangle (Obtuse)
- B. Hexagon
- C. Quadrilateral (Rectangle)
- D. Triangle (Acute)
- E. Quadrilateral (Parallelogram)

37. Plot and connect the points in the order listed below. When you are done, choose the word that best identifies the resulting shape/polygon.  $A(-2, 0)$ ,  $B(7, 0)$ ,  $C(3, -4)$ ,  $D(7, -7)$ ,  $E(-2, -7)$

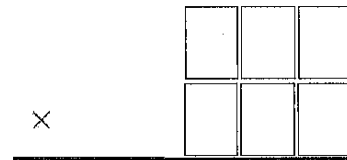


- A. Triangle (Right)
- B. Pentagon
- C. Hexagon
- D. Quadrilateral (Parallelogram)
- E. Quadrilateral (Rectangle)

38. Complete the standard multiplication algorithm for  $934 \times 396$ , including any "carried," or regrouped digits, if necessary.



39. Complete the standard multiplication algorithm for  $924 \times 327$ , including any "carried," or regrouped digits, if necessary.





40. Complete the standard multiplication algorithm for  $432 \times 958$ , including any "carried," or regrouped digits, if necessary.

$$\begin{array}{r} \times \phantom{000} \\ \hline \phantom{00} \square \square \square \\ \phantom{00} \square \square \square \end{array}$$

41. Complete the standard multiplication algorithm for  $5.2 \times 0.46$ , including any "carried," or regrouped digits, if necessary.

$$\begin{array}{r} \phantom{00} 5.2 \\ \times 0.46 \\ \hline \end{array}$$

42. Complete the standard multiplication algorithm for  $52 \times 0.27$ , including any "carried," or regrouped digits, if necessary.

$$\begin{array}{r} \phantom{00} 52 \\ \times 0.27 \\ \hline \end{array}$$

43. Complete the standard multiplication algorithm for  $59 \times 8.1$ , including any "carried," or regrouped digits, if necessary.

$$\begin{array}{r} \phantom{00} 59 \\ \times 8.1 \\ \hline \end{array}$$

44. Without dividing, determine if 58,812 is divisible by 6 and explain how you know.

45. Without dividing, determine if 25, 445 is divisible by 5 and explain how you know.

46. Without dividing, determine if 48, 548 is divisible by 2 and explain how you know.

47. Without dividing, determine if 11, 738 is divisible by 4 and explain how you know.

48. Without dividing, determine if 34, 062 is divisible by 3 and explain how you know.

49. Without dividing, determine if 63, 254 is divisible by 9 and explain how you know.

50. Without dividing, determine if 27, 753 is divisible by 3 and explain how you know.

51. Without dividing, determine if 56, 548 is divisible by 4 and explain how you know.

52. Without dividing, determine if 36, 565 is divisible by 5 and explain how you know.

53. Without dividing, determine if 18, 448 is divisible by 4 and explain how you know.

54. Use multiplication to expand the expression below. Then compute.

$$0^2$$

55. Use an exponent to condense the expression below.  
Then compute.

$$6 \times 6 \times 6 \times 6$$

56. Use multiplication to expand the expression below.  
Then compute.

$$8^3$$

57. Use multiplication to expand the expression below.  
Then compute.

$$(-6)^5$$

58. Use an exponent to condense the expression below.  
Then compute.

$$-7 \times -7$$

59. Use multiplication to expand the expression below.  
Then compute.

$$(-7)^2$$

60. What is the value of the expression  $3^4 + 6 \times 7$ ?

61. What is the value of the expression  
 $5 \times 10 + 4 + 5 \times 4^2$ ?

62. What is the value of the expression  $\frac{(65+4^2)}{3^3}$ ?

63. Identify the property that justifies each step asked  
about in the answer area below.

Line 1:  $q(p + 3)$

Line 2:  $qp + q \cdot 3$

Line 3:  $pq + 3q$

Line 1 to Line 2:

---

Line 2 to Line 3:

---

64. Identify the property that justifies each step asked about in the answer area below.

Line 1:  $(x + 10)(9 + 8x)$

Line 2:  $(x + 10)(8x + 9)$

Line 3:  $(8x + 9)(x + 10)$

Line 1 to Line 2:

---

Line 2 to Line 3:

---

65. Identify the property that justifies each step asked about in the answer area below.

Line 1:  $10(5 + 9x)$

Line 2:  $10(9x + 5)$

Line 3:  $90x + 50$

Line 1 to Line 2:

---

Line 2 to Line 3:

---

66. Identify the property that justifies each step asked about in the answer area below.

Line 1:  $(7 + 10x) + 3$

Line 2:  $(10x + 7) + 3$

Line 3:  $10x + (7 + 3)$

Line 4:  $10x + 10$

Line 1 to Line 2:

---

Line 2 to Line 3:

---

67. Identify the property that justifies each step asked about in the answer area below.

Line 1:  $(8x)(4y)$

Line 2:  $8 \cdot (x \cdot 4) \cdot y$

Line 3:  $8 \cdot (4 \cdot x) \cdot y$

Line 4:  $(8 \cdot 4)(x \cdot y)$

Line 5:  $32xy$

Line 1 to Line 2:

---

Line 2 to Line 3:

---

Line 3 to Line 4:

---

68. Represent the following sentence as an algebraic expression, where "a number" is the letter  $x$ .

1 is decreased by a number.

69. Represent the following sentence as an algebraic expression, where "a number" is the letter  $x$ .

5 less than a number.

70. Represent the following phrase as an algebraic expression, where "a number" is the letter  $x$ . You do not need to simplify.

Four times the difference of 8 and a number.

71. Represent the following phrase as an algebraic expression, where "a number" is the letter  $x$ . You do not need to simplify.

The difference of 1 and the square of a number.

72. Represent the following phrase as an algebraic expression, where "a number" is the letter  $x$ . You do not need to simplify.

8 plus the cube of a number.

73. Which equation has the solution  $x = 4$ ?

- A.  $4x - 4 = 12$
- B.  $9x + 2 = -38$
- C.  $4x - 3 = 41$
- D.  $5x - 1 = 46$

74. What value of  $x$  makes the equation below true?

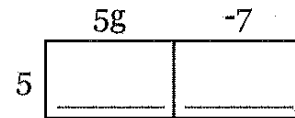
$$9x - 10 = 53$$

- A. 7
- B. 8
- C. 17
- D. 53

75. Which equation has the solution  $x = 2$ ?

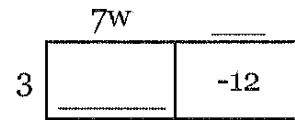
- A.  $5x + 1 = 34$
- B.  $9x - 7 = 101$
- C.  $3x - 9 = -3$
- D.  $3x - 1 = -5$

76. Enter the missing values in the area model to find  $5(5g - 7)$



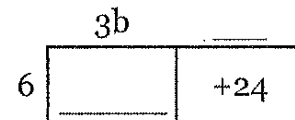
According to the model above,  $5(5g - 7) =$  \_\_\_\_\_

77. Enter the missing values in the area model to find  $3(7w - 4)$



According to the model above,  $3(7w - 4) =$  \_\_\_\_\_

78. Enter the missing values in the area model to find  $6(3b + 4)$



According to the model above,  $6(3b + 4) =$  \_\_\_\_\_

79. Use the distributive property to write an equivalent expression.

$$2(k + 4)$$

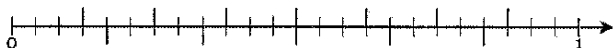
80. Use the distributive property to write an equivalent expression.

$$7(6k - 6m + 1)$$

81. Use the distributive property to write an equivalent expression.

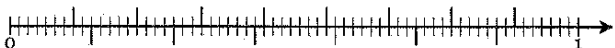
$$3(7s + 2t)$$

82. Use the number line to determine which fraction is larger:  $\frac{7}{8}$  or  $\frac{5}{6}$ . The segment from 0 to 1 has been partitioned into 24 pieces, the smallest number needed to plot both fractions. (a) Plot a fraction equivalent to  $\frac{7}{8}$ . (b) Plot a fraction equivalent to  $\frac{5}{6}$ . (c) Complete the sentence below.



$\frac{7}{8}$  is  $\begin{pmatrix} \text{greater} \\ \text{less} \end{pmatrix}$  than  $\frac{5}{6}$  because  $\frac{7}{8} = \frac{\boxed{\phantom{000}}}{24}$  and  $\frac{5}{6} = \frac{\boxed{\phantom{000}}}{24}$

83. Use the number line to determine which fraction is larger:  $\frac{4}{9}$  or  $\frac{3}{7}$ . The segment from 0 to 1 has been partitioned into 63 pieces, the smallest number needed to plot both fractions. (a) Plot a fraction equivalent to  $\frac{4}{9}$ . (b) Plot a fraction equivalent to  $\frac{3}{7}$ . (c) Complete the sentence below.



$\frac{4}{9}$  is  $\begin{pmatrix} \text{greater} \\ \text{less} \end{pmatrix}$  than  $\frac{3}{7}$  because  $\frac{4}{9} = \frac{\boxed{\phantom{000}}}{63}$  and  $\frac{3}{7} = \frac{\boxed{\phantom{000}}}{63}$

84. Determine which fraction is larger:  $\frac{3}{4}$  or  $\frac{4}{7}$

(a) Find a common denominator: \_\_\_\_\_

(b) Fill in boxes marked (a) with the common denominator found above, then fill in the other boxes and complete the sentence:

$\frac{3}{4} = \frac{\boxed{\phantom{000}}}{\boxed{\phantom{000}}}$  and  $\frac{4}{7} = \frac{\boxed{\phantom{000}}}{\boxed{\phantom{000}}}$ , so  $\frac{3}{4}$  is  $\begin{pmatrix} \text{greater} \\ \text{less} \end{pmatrix}$  than  $\frac{4}{7}$ .

85. Determine which fraction is larger:  $\frac{6}{7}$  or  $\frac{8}{9}$

(a) Find a common denominator: \_\_\_\_\_

(b) Fill in boxes marked (a) with the common denominator found above, then fill in the other boxes and complete the sentence:

$\frac{6}{7} = \frac{\boxed{\phantom{000}}}{\boxed{\phantom{000}}}$  and  $\frac{8}{9} = \frac{\boxed{\phantom{000}}}{\boxed{\phantom{000}}}$ , so  $\frac{6}{7}$  is  $\begin{pmatrix} \text{greater} \\ \text{less} \end{pmatrix}$  than  $\frac{8}{9}$ .

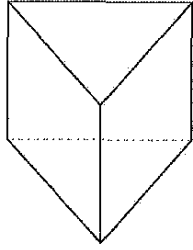
86. Determine which fraction is larger:  $\frac{3}{5}$  or  $\frac{5}{9}$

(a) Find a common denominator: \_\_\_\_\_

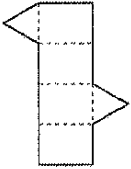
(b) Fill in boxes marked (a) with the common denominator found above, then fill in the other boxes and complete the sentence:

$\frac{3}{5} = \frac{\boxed{\phantom{000}}}{\boxed{\phantom{000}}}$  and  $\frac{5}{9} = \frac{\boxed{\phantom{000}}}{\boxed{\phantom{000}}}$ , so  $\frac{3}{5}$  is  $\begin{pmatrix} \text{greater} \\ \text{less} \end{pmatrix}$  than  $\frac{5}{9}$ .

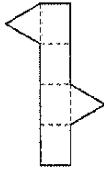
87. Which figure represents a net of the solid below?



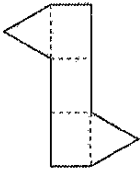
A



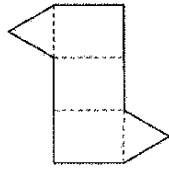
B



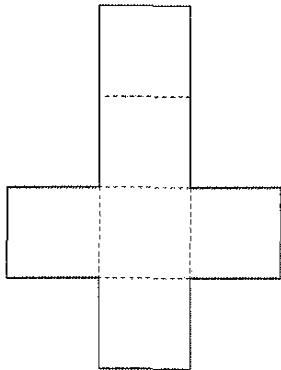
C



D



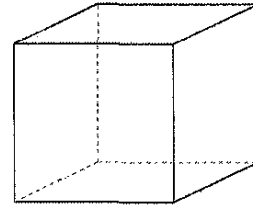
88. The net below represents a three-dimensional object.



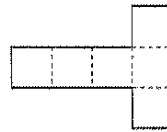
Which three-dimensional object does it represent?

- A. triangular prism
- B. cube
- C. square pyramid
- D. triangular pyramid

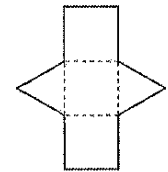
89. Which figure represents a net of the solid below?



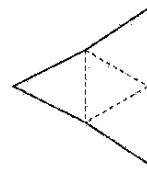
A



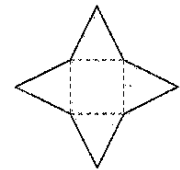
B



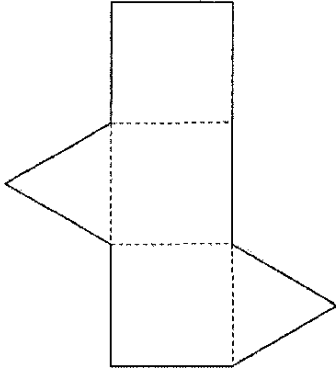
C



D



90. The net below represents a three-dimensional object.

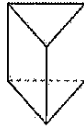


Which three-dimensional object does it represent?

A



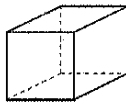
B



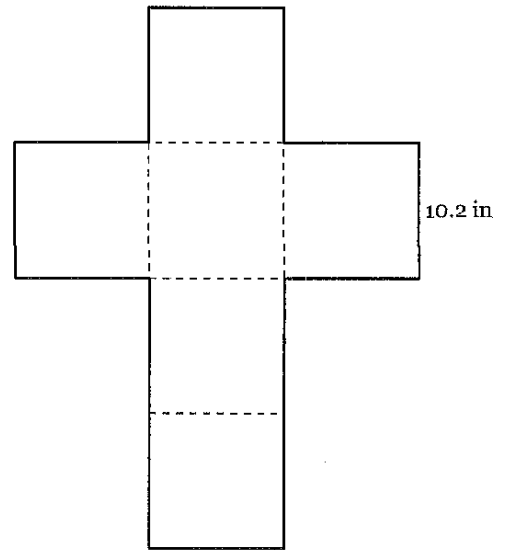
C



D

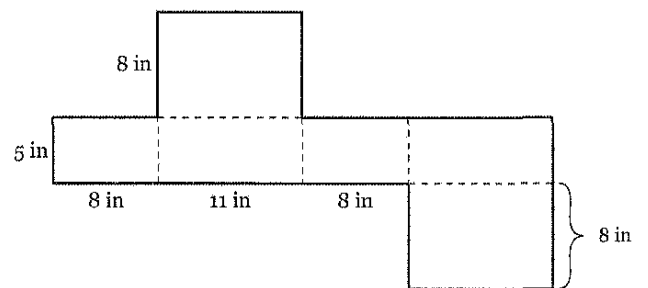


91. Nathan wraps a gift box in the shape of a cube. The figure below shows a net for the gift box.



How much wrapping paper did he use, in square inches?

92. Bao is decorating the outside of a box in the shape of a right rectangular prism. The figure below shows a net for the box.

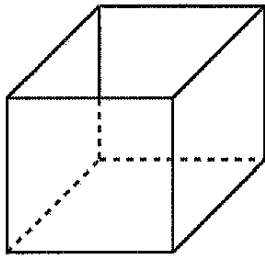


What is the surface area of the box, in square inches, that Bao decorates?

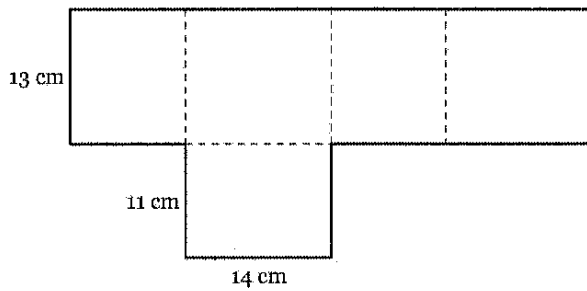


93. Sebastian built a toy box in the shape of a rectangular prism with an open top. The diagram below shows the toy box and a net of the toy box.

TOY BOX

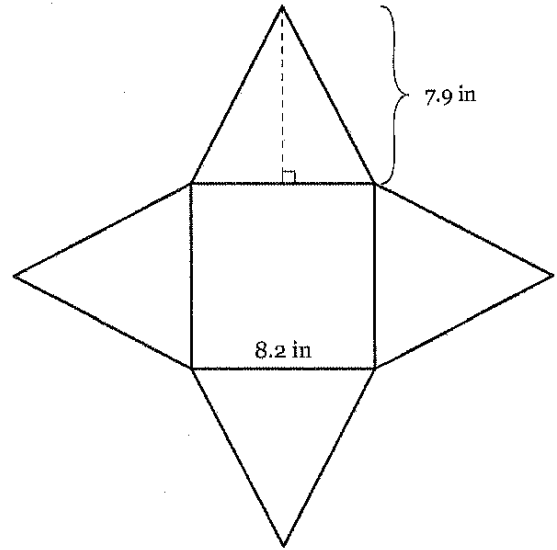


NET OF TOY BOX



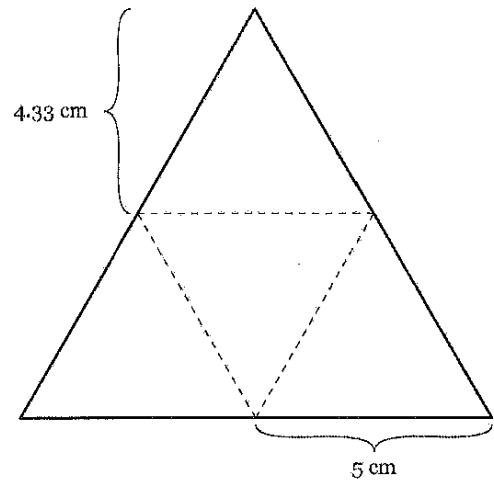
What is the surface area, in square centimeters, of the toy box?

94. The figure below is a net for a square pyramid.



What is the surface area of the square pyramid, in square inches?

95. The figure below is a net for a triangular pyramid.



If all the triangles are equilateral, what is the surface area of the pyramid, in square centimeters?

96. In a popular online role playing game, players can create detailed designs for their character's "costumes," or appearance. Alonso sets up a website where players can buy and sell these costumes online. Information about the number of people who visited the website and the number of costumes purchased in a single day is listed below.

150 visitors purchased no costume.

163 visitors purchased exactly one costume.

23 visitors purchased more than one costume.

Based on these results, express the probability that the next person will purchase exactly one costume as a percent to the nearest whole number.

97. Stella recorded the grade-level and instrument of everyone in the middle school School of Rock below.

Seventh Grade Students

Instrument	# of Students
Guitar	13
Bass	13
Drums	7
Keyboard	8

Eighth Grade Students

Instrument	# of Students
Guitar	13
Bass	8
Drums	13
Keyboard	12

Based on these results, express the probability that a student chosen at random will play the drums as a decimal to the nearest hundredth.

98. Alonso recorded the grade-level and instrument of everyone in the middle school School of Rock below.

Seventh Grade Students

Instrument	# of Students
Guitar	9
Bass	13
Drums	6
Keyboard	13

Eighth Grade Students

Instrument	# of Students
Guitar	4
Bass	5
Drums	4
Keyboard	2

Based on these results, express the probability that an eighth grader chosen at random will play the guitar as a fraction in simplest form.

99. A spinner is divided into five colored sections that are not of equal size: red, blue, green, yellow, and purple. The spinner is spun several times, and the results are recorded below:

Spinner Results

Color	Frequency
Red	18
Blue	11
Green	12
Yellow	15
Purple	18

Based on these results, express the probability that the next spin will land on red or green or yellow as a percent to the nearest whole number.

100. Carson recorded the grade-level and instrument of everyone in the middle school School of Rock below.

Seventh Grade Students

Instrument	# of Students
Guitar	7
Bass	9
Drums	12
Keyboard	2

Eighth Grade Students

Instrument	# of Students
Guitar	7
Bass	10
Drums	8
Keyboard	11

Based on these results, express the probability that an eighth grader chosen at random will play an instrument other than drums as a fraction in simplest form.

101. Elijah owns a small business selling used books. He knows that in the last week 9 customers paid cash, 11 customers used a debit card, and 106 customers used a credit card.

Based on these results, express the probability that the next customer will pay with something other than a debit card as a decimal to the nearest hundredth.

102. Khadija is trying to pick out an outfit for the first day of school. She can choose from 2 pairs of pants, 2 t-shirts, and 6 pairs of shoes. How many different outfits does Khadija have to choose from?

103. Julian is designing a new board game, and is trying to figure out all the possible outcomes. How many different possible outcomes are there if he spins a spinner with four equal-sized sections labeled Red, Green, Blue, Orange and rolls a fair die in the shape of a cube that has six sides labeled 1 to 6?

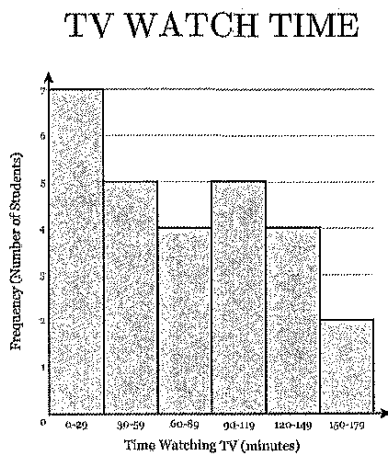
104. Three students, Nicole, Xavier, and Avani, line up one behind the other. How many different ways can they stand in line?

105. Five students, Arianna, Bella, Isaac, Santiago, and Paisley, line up one behind the other. How many different ways can they stand in line?

106. There are 28 students in a homeroom. How many different ways can they be chosen to be elected President, Vice President, Treasurer, and Secretary?

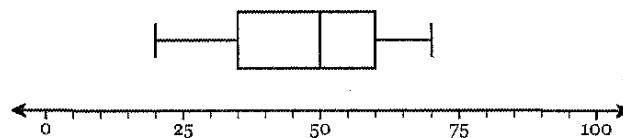
107. There are 18 students in a homeroom. How many different ways can they be chosen to be elected President, Vice President, Treasurer, and Secretary?

108. The graph below represents results of a survey in which students stated the number of minutes they'd spent watching TV the previous day.

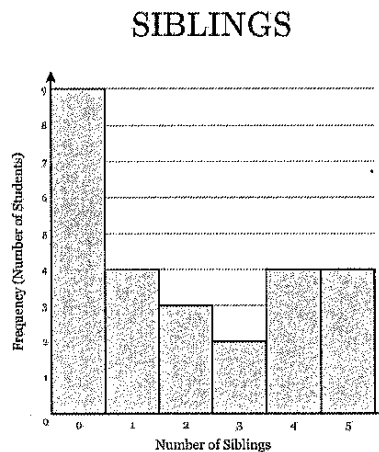


What was the most common interval of minutes students spent watching TV?

109. The box plot below represents some data set. What is the minimum value of the data?

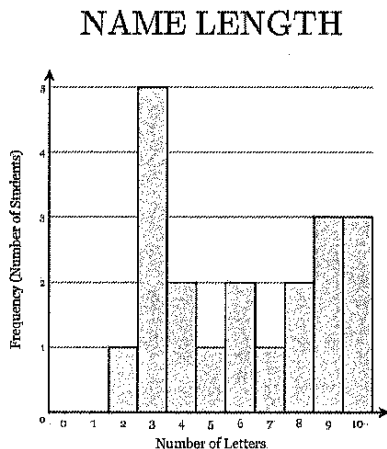


110. The graph below represents the number of siblings each student in a class has.



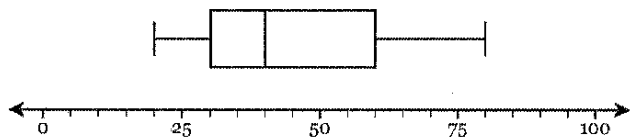
What was the range of number of siblings?

111. The graph below represents the result of a survey in which a number of students reported how many letters were in their last names.



What was the mean name length?

112. The box plot below represents some data set. What percentage of the data values are *greater than* 60?



113. The circumference of a circle is  $13\pi$  in. What is the area, in square inches? Express your answer in terms of  $\pi$ .

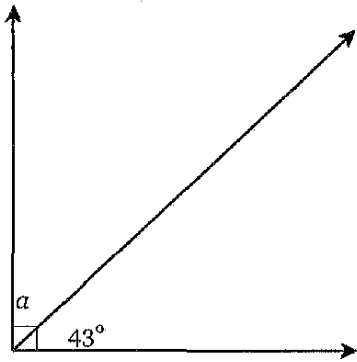
114. The area of a circle is  $121\pi$  in<sup>2</sup>. What is the circumference, in inches? Express your answer in terms of  $\pi$ .

115. The area of a circle is  $100\pi$  ft<sup>2</sup>. What is the circumference, in feet? Express your answer in terms of  $\pi$ .

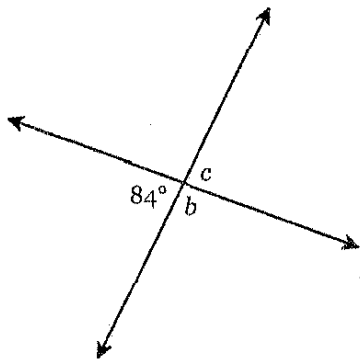
116. The circumference of a circle is  $25\pi$  m. What is the area, in square meters? Express your answer in terms of  $\pi$ .

117. The circumference of a circle is  $20\pi$  cm. What is the area, in square centimeters? Express your answer in terms of  $\pi$ .

118. Find the measure of the missing angle.

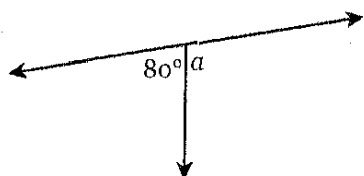


119. Find the measure of the missing angles.

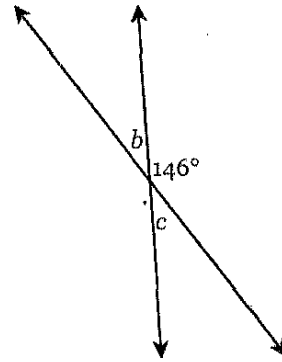


$b = \underline{\hspace{1cm}}^\circ$        $c = \underline{\hspace{1cm}}^\circ$

120. Find the measure of the missing angle.

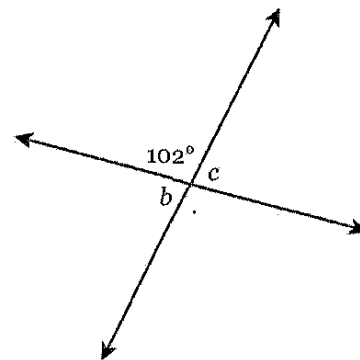


121. Find the measure of the missing angles.



$b = \underline{\hspace{1cm}}^\circ$        $c = \underline{\hspace{1cm}}^\circ$

122. Find the measure of the missing angles.



$b = \underline{\hspace{1cm}}^\circ$        $c = \underline{\hspace{1cm}}^\circ$

123. The radius of a circle is 6 ft. Find its circumference in terms of  $\pi$ .

124. The diameter of a circle is 15 ft. Find its circumference in terms of  $\pi$ .

125. The radius of a circle is 2.8 cm. Find the circumference *to the nearest tenth*.

126. The diameter of a circle is 7 ft. Find the circumference *to the nearest tenth*.

127. The radius of a circle is 15 in. Find its area in terms of  $\pi$ .

128. The diameter of a circle is 10 in. Find its area in terms of  $\pi$ .

129. The diameter of a circle is 9 cm. Find its area *to the nearest whole number*.

130. The radius of a circle is 7 in. Find its area *to the nearest whole number*.



