

**8th grade NESa math assessment review. No calculators, but you may use the formula sheet.**

**Evaluate the expression.**

1.  $2[22 - (8 + 2)]$ 
  - a. 24
  - b. 44
  - c. 32
  - d. 42
2.  $\frac{7-3}{5-3}$ 
  - a.  $\frac{5}{4}$
  - b. 2
  - c. 5
  - d.  $\frac{1}{2}$
3.  $1 + 4 \cdot 5$ 
  - a. 25
  - b. 20
  - c. 10
  - d. 21
4.  $-24 - (-10)$ 
  - a. 34
  - b. 14
  - c. -14
  - d. -34
5.  $0.5 + \frac{4}{5}$ 
  - a.  $\frac{1}{2}$
  - b.  $\frac{5}{7}$
  - c.  $\frac{10}{13}$
  - d.  $1\frac{3}{10}$

**Evaluate the expression when**

$x = 3$ ,  $y = 21$ , and  $z = 2$ .

6.  $\frac{(x^3 - y)}{x} + z$ 
  - a. 4
  - b. -4
  - c. 8
  - d. 11

**Order the integers from least to greatest.**

7. -9, 0, 14, -1, -5
  - a. -9, -5, -1, 0, 14
  - b. 14, 0, -1, -5, -9
  - c. 0, -1, -5, -9, 14
  - d. 14, -9, -5, -1, 0

**8. Order the numbers from least to greatest.**

$1\frac{1}{2}$ , 1.3, 0,  $\frac{2}{3}$ , 1.25, 1

- A  $0, \frac{2}{3}, 1, 1\frac{1}{2}, 1.25, 1.3$
- B  $0, \frac{2}{3}, 1, 1.3, 1.25, 1\frac{1}{2}$
- C  $0, \frac{2}{3}, 1, 1.25, 1\frac{1}{2}, 1.3$
- D  $0, \frac{2}{3}, 1, 1.25, 1.3, 1\frac{1}{2}$

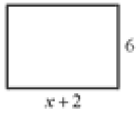
**9. Evaluate the expression when  $x = -9$ .**

$-7 + |x|$

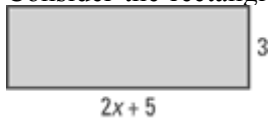
- a. -15
- b. 2
- c. 15
- d. -2

Find the value of  $x$  for the figure.

10. Perimeter = 28



- a. 20  
b. 6  
c. 7  
d. 21
11. Consider the rectangle shown.



Write an expression for the area of the rectangle.

- a.  $A = 3 + (2x + 5)$   
b.  $A = 2(3) + 2(2x + 5)$   
c.  $A = 3(2x + 5)$   
d.  $A = 3(2x+5)$
12. Use the distributive property to write and equivalent expression for:  $-4(x - 4)$
- a.  $-4x - 4$   
b.  $-4x - 16$   
c.  $-4x + 4$   
d.  $-4x + 16$
13. Write an expression for "three less than five times a number  $x$ ."
- A.  $3 - 5x$   
B.  $5x + 3$   
C.  $5x - 3$   
D.  $5(x - 3)$

14. The perimeter of a rectangular garden is 860 ft. The two short sides of the garden are each 30 ft long. You are asked to find the length of the other sides. Which equation models this situation?
- a.  $30 + x = 860$   
b.  $2(30) + 2x = 860$   
c.  $30(x - 2) = 860$   
d.  $30 + 2x = 860$

**Solve the equation.**

15.  $8 = 3x + 5x$
- a. 1  
b. -8  
c. -1  
d. 8
16.  $9n + 29 - 5n + 29 = 2$
- a. -13  
b. 14  
c. 13  
d. -14
17. What is the first step in solving this equation?  
 $-2(6n - 5) = -26$
- a. combine terms  $6n$  and  $-5$   
b. distribute the  $-2$  to remove the parentheses  
c. add a positive 2 on both sides  
d. add a positive 26 on both sides
18.  $-x + 6 = 8$
- a. 2  
b. 14  
c. -14  
d. -2
19.  $-\frac{q}{4} + 3 = 18$
- a. -60  
b. 60  
c. 84  
d. -84

**Solve the equation.**

20.  $-7 + 3x = x + 11$   
 a. 4  
 b. 9  
 c. 1  
 d. -8
21.  $2(5x - 2) = x + 5$   
 a.  $\frac{1}{9}$   
 b.  $\frac{7}{9}$   
 c. 1  
 d. -1

**Write the verbal sentence as an equation.**

22. Fifteen plus twice a number is equal to 3 times the number.  
 a.  $15 + 2x = 3x$   
 b.  $15 + 3x = 2x$   
 c.  $15 = 2x + 3x$   
 d.  $15 + 2x = 3$
23. A car-rental company charges a flat fee of \$195 and \$.20 per mile to rent a popular model of a sports-utility vehicle. If the total cost to rent the vehicle for a 5-day ski trip was \$495, how many miles were driven? Write your equation you used to solve this problem as well.  
 a. 961 mi  
 b. 584 mi  
 c. 1500 mi  
 d. 1255 mi

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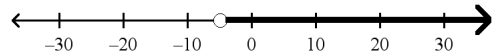


**Write the sentence as an inequality.**

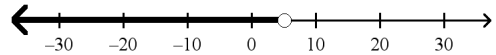
24. Two less than two times the number of students is less than eighty-four. (Then solve for n)  
 a.  $2n - 2 > 84$   
 b.  $2n - 2 \leq 84$   
 c.  $2n - 2 < 84$   
 d.  $2n - 2 \geq 84$

25. Lev earns \$5.00 per hour working after school. He needs at least \$245 for a stereo system. Write and then solve an inequality that describes how many hours he must work to reach his goal.  
 a.  $x + 5.00 \geq 245$   
 b.  $5.00x \geq 245$   
 c.  $245 \div x \geq 5.00$   
 d.  $5.00x \geq 245$

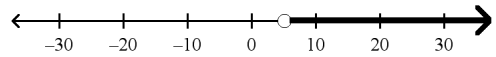
26.  $-7x > 35$   
 a.  $x > -5$



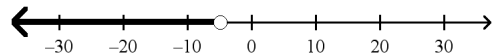
- b.  $x < 5$



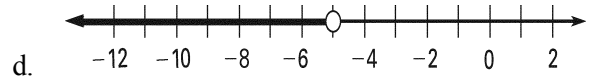
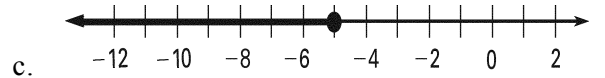
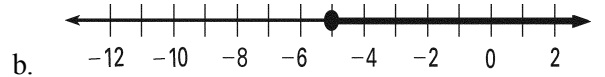
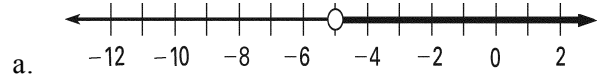
- c.  $x > 5$



- d.  $x < -5$

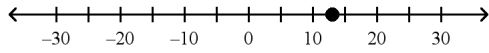


27. Graph the inequality  $-2x + 16 \leq 26$ .

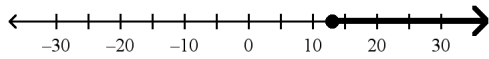


28.  $-20b + 15 \geq -19b + 2$

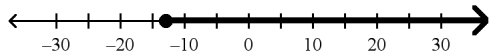
a.  $b = 13$



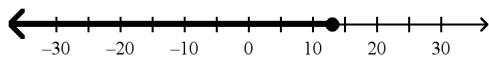
b.  $b \geq 13$



c.  $b \geq -13$



d.  $b \leq 13$



29. Write the number in scientific notation.

0.00000258

a.  $2.58 \times 10^6$

b.  $2.58 \times 10^{-6}$

c.  $258 \times 10^{-8}$

d.  $0.258 \times 10^{-5}$

30. Write the number in standard form.

$7.13 \times 10^{-4}$

a. 713,000

b. 0.0000713

c. 0.00713

d. 0.000713

31. Simplify the quotient. Write your answer as a power.

$$\frac{(-4)^{13}}{(-4)^{10}}$$

a.  $1^3$

b.  $(-4)^3$

c.  $(-4)^{23}$

d.  $4^3$

32.  $\frac{t^{15}}{t^{13}}$

a.  $t^2$

b.  $t^{195}$

c.  $t^{28}$

d. none of these

Simplify the product.

33.  $-(-3)^4$

a. -27

b. -81

c. -24

d. 81

34.  $(3-5)^3$

a. 8

b. 4

c. -4

d. -8

Evaluate the powers.

35.  $3^3$

a. 26

b. 27

c. 18

d. 9

36.  $1^4$

a. 1

b. 8

c. 4

d. 2

37.  $0^5$

a. 0

b. 5

c. 1

d. none of the above

**Simplify:**

38.  $2^2 + 9 + 7^0$   
a. 252  
b. 36  
c. 14  
d. 20
39.  $3^2 + 4^2 - 6^0 + 3^1$   
a. 11  
b. 23  
c. 27  
d. 16

**Write the fraction as a decimal.**

40.  $\frac{17}{20}$   
a. 0.22  
b. 0.85  
c. 0.58  
d. 1.17647

**Write the decimal as a fraction.**

41. 0.85  
a.  $\frac{17}{20}$   
b.  $\frac{17}{200}$   
c.  $1\frac{3}{17}$   
d. 85

**Find the sum or difference.**

42.  $13\frac{1}{13} - 1\frac{12}{13}$   
a. 15  
b.  $1\frac{3}{13}$   
c.  $11\frac{2}{13}$   
d.  $12\frac{2}{13}$

43.  $6\frac{1}{4} - 3\frac{1}{6}$   
a.  $2\frac{1}{12}$   
b.  $3\frac{1}{12}$   
c. 4  
d.  $4\frac{1}{24}$

**Find the product or quotient.**

44.  $\frac{1}{7} \cdot \frac{2}{8}$   
a.  $1\frac{3}{4}$   
b.  $\frac{4}{7}$   
c.  $\frac{1}{28}$   
d.  $\frac{2}{15}$
45.  $\frac{2}{9} \cdot \left(8\frac{1}{4}\right)$   
a.  $8\frac{1}{18}$   
b.  $1\frac{5}{6}$   
c.  $8\frac{17}{36}$   
d.  $37\frac{1}{8}$
46.  $\frac{7}{3} \div \frac{4}{5}$   
a.  $2\frac{11}{12}$   
b.  $\frac{12}{35}$   
c.  $1\frac{13}{15}$   
d.  $\frac{15}{28}$

47.  $1\frac{1}{10} \div 1\frac{5}{9}$

- a.  $1\frac{2}{19}$
- b.  $\frac{99}{140}$
- c.  $1\frac{41}{99}$
- d.  $\frac{15}{19}$

48.  $\frac{2}{3} \div \frac{6}{7} - \frac{1}{2}$

- a.  $2\frac{2}{5}$
- b.  $\frac{5}{18}$
- c.  $3\frac{3}{5}$
- d.  $\frac{1}{3}$

STOP HERE FOR TODAY!!!



Solve the equations.

49.  $\frac{2}{9} = \frac{8}{9} + n$

- a.  $-\frac{2}{3}$
- b.  $\frac{10}{9}$
- c.  $\frac{2}{3}$
- d. none of these

50.  $50 = \frac{5}{2}x$

- a. 25
- b. 125
- c. 20
- d. 10

51.  $2 = \frac{5}{9}y - 8$

- a.  $5\frac{5}{9}$
- b. 19
- c. 18
- d.  $10\frac{2}{9}$

Write the equivalent rate.

52.  $\frac{99 \text{ km}}{\text{hour}} = \frac{? \text{ km}}{\text{min}}$

- a. 15
- b. 2.5
- c. 1.65
- d. 5940

53. Write the ratio of vowels to consonants in GALIANO in lowest terms.

- a. 3:4
- b. 7:2
- c. 4:3
- d. 2:7

Solve the proportion.

54.  $\frac{2}{7} = \frac{a}{35}$

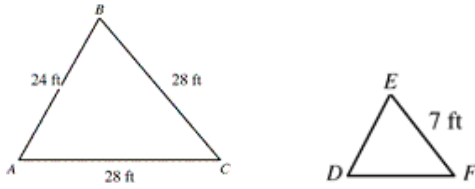
- a. 8
- b. 10
- c. 14
- d. 5

55. Mr. Jones has taken a survey of college students and found that 1 out of 3 students are liberal arts majors. If a college has 11,000 students, what is the best estimate of the number of students who are liberal arts majors?

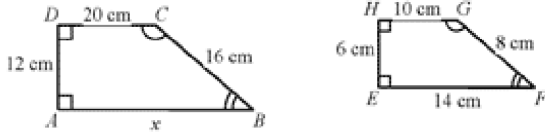
- a. 165
- b. 3667
- c. 33,000
- d. 367

56. While attending a school carnival, you estimate the ratio of children to adults as 3:2. If there are 450 people at the carnival, about how many children are in attendance?
- about 450
  - about 225
  - about 270
  - about 180

57. Triangle  $ABC$  is similar to triangle  $DEF$ . Find the length of side  $DE$ . (The figures may not be drawn to scale.)



- 6 ft
  - $\frac{1}{6}$  ft
  - 7 ft
  - 4 ft
58. Given  $ABCD \sim EFGH$ , find  $x$ . (The figures may not be drawn to scale.)



- 29 cm
  - 25 cm
  - 28 cm
  - 30 cm
- The scale on a map is 1 centimeter : 5 kilometers. Use the given actual distance to find the distance on the map.**

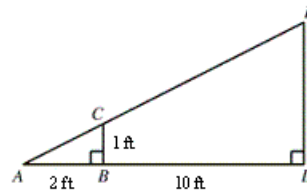
59. 105 km
- 30 cm
  - 21 cm
  - 10.5 cm
  - 525 cm

60. The smaller box is 2 feet tall and casts a shadow 7 feet. The larger box is 4 feet tall. (The figures may not be drawn to scale.)



- How long is the shadow that the larger box casts?
- 2 ft
  - 49 ft
  - 14 ft
  - 6 ft

61. The extendable ramp shown below is used to move crates of fruit to loading docks of different heights.  $\triangle ABC$  and  $\triangle ADE$  are similar. When the horizontal distance  $AB$  is 2 feet, the height of the loading dock,  $BC$ , is 1 feet. What is the height of the loading dock,  $DE$ ? (Diagram not drawn to scale.)



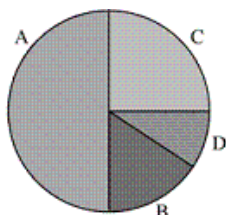
- 10 ft
  - 2 ft
  - 6 ft
  - 5 ft
62. On a blueprint, the scale indicates that 1 centimeter represent 15 feet. What is the length of a room that is 8 centimeters long and 6 centimeters wide on the blueprint?



- The room is 120 feet long.
- The room is 90 feet long.
- The room is 48 feet long.
- The room is 210 feet long.

The scale on a map is 1 inch : 15 miles. Use the given map distance to find the actual distance in miles.

63. 14.5 in.  
 a. 217.5 mi  
 b. 2.5 mi  
 c. 150 mi  
 d. 2135 mi
64. A small-business owner analyzed her business expenses for the last year. She calculated that about 15% of her total expenses went to pay suppliers, 51% went to pay employee costs, 10% went to pay for advertising and shipping costs, and the rest was for rent, utilities, and miscellaneous costs. If the circle graph below represents her expenses, which section of the graph illustrates her payments to suppliers?



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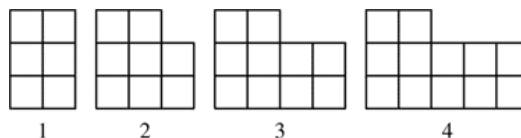


65. Find a function rule that matches the input-output table.

Input $x$	1	2	3	4	5
Output $y$	9	12	15	18	21

- a.  $y = 5 + 4x$   
 b.  $y = 4 + 5x$   
 c.  $y = 6 + 3x$   
 d.  $y = 3 + 6x$

66.



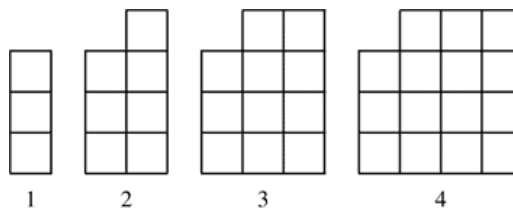
The input  $x$  is the number below each figure. The output  $y$  is the number of squares in a figure.

Input $x$	1	2	3	4
Output $y$	6	8	10	12

What equation can be used to find the number of squares in the figure?

- a.  $y = 6x + 2$   
 b.  $y = 2x + 4$   
 c.  $y = x + 2$   
 d.  $y = 6x$

67.



If the input  $x$  is the number below each figure, what equation can be used to find the total number of squares,  $y$ , in a figure?

- a.  $y = 4x + 3$   
 b.  $y = 3x - 1$   
 c.  $y = 4x - 1$   
 d.  $y = 3x + 4$

68. Write a rule that describes the relationship between  $x$  and  $y$  in the following table.

$x$	4	5	6	7
$y$	16	25	36	49

- a.  $y = 5 - x$   
 b.  $y = 5x$   
 c.  $y = x^2$   
 d.  $y = x^5$



69. Give the best classification of the numbers.

$$\sqrt{8}$$

- a. Irrational
- b. Rational
- c. Whole
- d. Integer

70.  $\sqrt{144}$

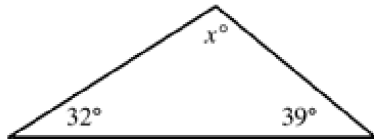
- a. Irrational
- b. Rational
- c. Whole
- d. Real

71. What is the classification for  $1/2$ ?

- A Natural
- B Irrational
- C Integer
- D Rational

**Find the value of  $x$ .**

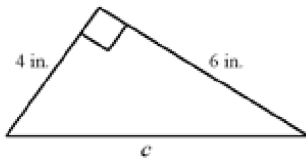
72.



- a. 109
- b. 51
- c. 71
- d. 58

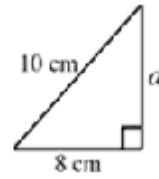
**Estimate the unknown length.**

73.



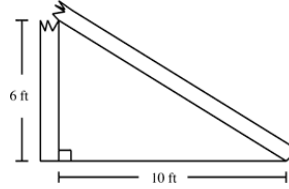
- a. 52.0 in.
- b. 8.3 in.
- c. 7.2 in.
- d. 14.4 in.

74. Find the missing side length.



- a. 2 cm
- b. 3 cm
- c. 4 cm
- d. 6 cm

75. A telephone pole breaks and falls as shown.

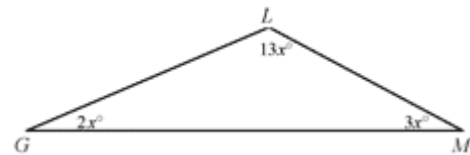


To the nearest foot, what was the original height of the pole? Write your answer as a square root and then estimate your answer. Show both answers in your work.

- a. 17 ft
- b. 19 ft
- c. 18 ft
- d. 20 ft

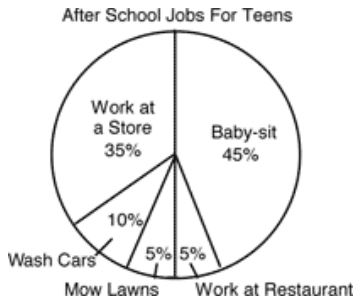
**Find the value of  $x$ . Then classify the triangle by its angle measures.** (Not be drawn to scale.)

76.



- a. 9; obtuse
- b. 10; obtuse
- c. 11; acute
- d. 20; acute

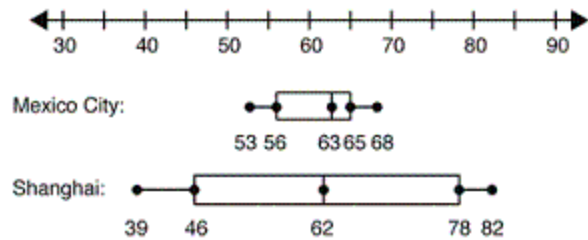
77. The circle graph shows jobs held by 300 teenagers.



How many teenagers held jobs baby-sitting?

- 90
- 150
- 100
- 135

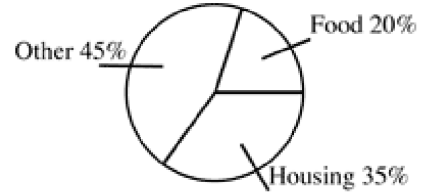
The box-and-whisker plots below show the mean monthly temperatures (°F) for Mexico City, Mexico, and Shanghai, China.



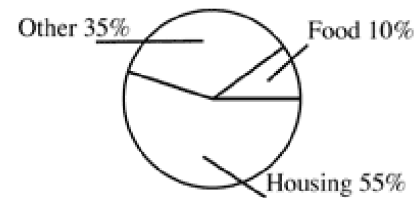
78. What percent of the temperatures for Shanghai fall between 39°F and 46°F?
- 25%
  - 50%
  - 75%
  - 100%

79. In a weekly budget, \$100 is spent on food, \$175 is spent on housing, and \$225 is spent on other items. Make a circle graph that represents the data.

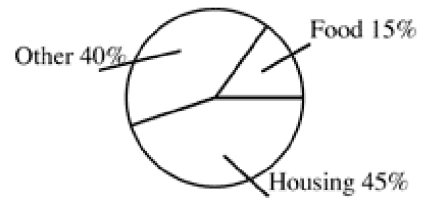
a.



b.



c.



d. none of these

80. A coin is tossed and a single number cube can be rolled. What is the probability that the coin shows heads and the number cube shows 4 or 5?

- $\frac{1}{2} \times \frac{1}{6}$
- $\frac{1}{2} + \frac{1}{3}$
- $\frac{1}{2} \times \frac{1}{3}$
- $\frac{1}{2} \times \frac{1}{2}$

Each letter in DECAFFEINATED is written on a separate piece of paper and put into a bag. Randomly choosing a piece of paper from the bag find the probability of the event and write it as a fraction.

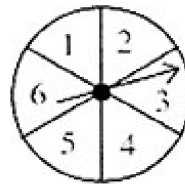
81. You do NOT choose an E.

- a.  $\frac{3}{13}$
- b.  $\frac{10}{13}$
- c.  $\frac{9}{13}$
- d.  $\frac{10}{13}$

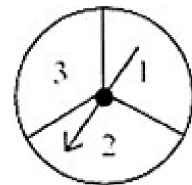
82. Gracie has 5 quarters, 4 nickels, and 1 penny in her pocket. She selects a coin at random. What is the probability of not selecting a nickel?

- a.  $\frac{3}{5}$
- b.  $\frac{2}{5}$
- c.  $\frac{4}{5}$
- d.  $\frac{1}{5}$

83. The spinners are divided into equal parts. Spinner A is spun, and then Spinner B is spun. What is the probability of landing on 1 both times?



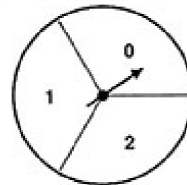
Spinner A



Spinner B

- a.  $\frac{1}{9}$
- b.  $\frac{1}{18}$
- c.  $\frac{5}{4}$
- d.  $\frac{1}{24}$

84. The spinner is divided into equal parts. What is the probability of drawing a card with the number 2 on it and having the spinner land on the number 1?



- a.  $\frac{1}{5}$
- b.  $\frac{1}{6}$
- c.  $\frac{1}{12}$
- d.  $\frac{1}{7}$

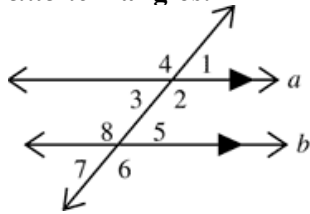
STOP HERE FOR TODAY!!!



Tell whether the angles are *complementary*, *supplementary*, or *neither*.

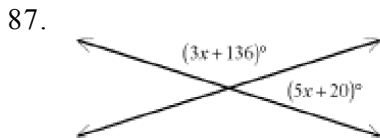
85.  $m\angle 5 = 51^\circ$   
 $m\angle 6 = 39^\circ$   
 a. supplementary  
 b. complementary  
 c. neither

Tell whether the angles in the diagram are *corresponding*, *alternate interior*, or *alternate exterior angles*.



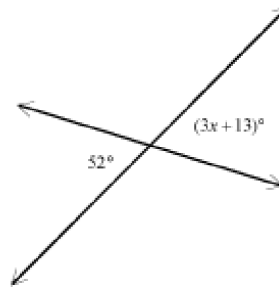
86.  $\angle 1$  and  $\angle 5$   
 a. alternate interior  
 b. alternate exterior  
 c. corresponding  
 d. vertical

The next 2 questions. Find the value of  $x$  in the figures. Also write what relationship the angles have with each other (vertical, corresponding, supplementary)



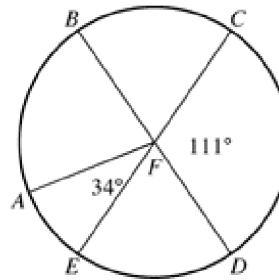
- a. 1  
 b. 3  
 c. 6  
 d. 4

88.



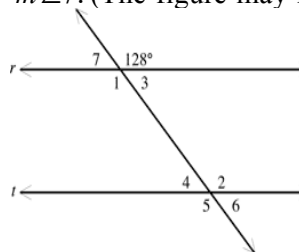
- a. 10  
 b. 8  
 c. 13  
 d. 169

89.  $\overline{BD}$  and  $\overline{CE}$  are diameters of circle  $F$ . What is the measure of  $\angle AFB$ ? (The figure may not be drawn to scale.)



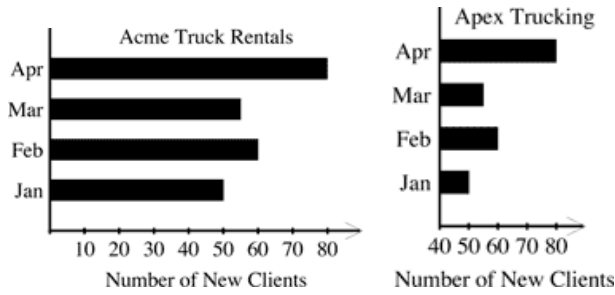
- a.  $145^\circ$   
 b.  $67^\circ$   
 c.  $155^\circ$   
 d.  $77^\circ$

90. Lines  $r$  and  $t$  are parallel. Find  $m\angle 2$  and  $m\angle 7$ . (The figure may not be drawn to scale.)



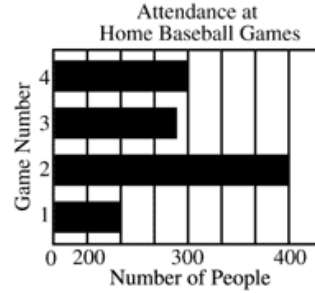
- a.  $m\angle 2 = 128^\circ$ ;  $m\angle 7 = 128^\circ$   
 b.  $m\angle 2 = 52^\circ$ ;  $m\angle 7 = 128^\circ$   
 c.  $m\angle 2 = 128^\circ$ ;  $m\angle 7 = 52^\circ$   
 d.  $m\angle 2 = 52^\circ$ ;  $m\angle 7 = 52^\circ$

91. The personnel manager for Acme Truck Rentals is trying to convince one of the best salesmen from Apex Trucking to take a job with Acme. The manager shows the following graphs to the salesman to show how many more new clients Acme has attracted in the last 4 months than Apex. Which conclusion could the salesman make?



- The second graph distorts the data because part of the scale is missing and makes Apex look much worse than it is.
- The graphs use different data and cannot be compared.
- The first graph distorts the data by making the bars extra long and makes Acme look much better than it is.
- The graphs are accurate and the salesman should take the job.

92. The bar graph shows the attendance at home baseball games at Southridge Community College.



Which statement is true about this graph?

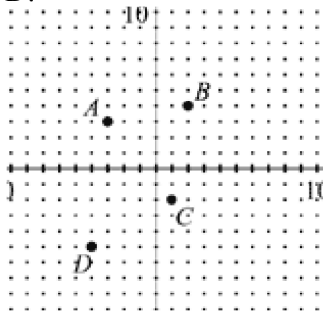
- All of these statements are true.
- The graph makes it appear that a small number of people attended Game 1, when in fact about 233 people attended the game.
- The graph makes it appear that twice as many people attended Game 4 than attended Game 1, which is not true.
- The graph makes it appear that about half as many people attended Game 3 as attended Game 2, which is not true.

Find the following measures of central tendency: mean, median, mode(s), and range of the data.

93. 16, 22, 14, 12, 20, 19, 14, 11
- mean: 16  
median: 15  
mode: 14  
range: 11
  - mean: 16  
median: 16  
mode: 14  
range: 5
  - mean: 16  
median: 14  
mode: 15  
range: 11
  - mean: 16  
median: 16  
mode: 14  
range: 11

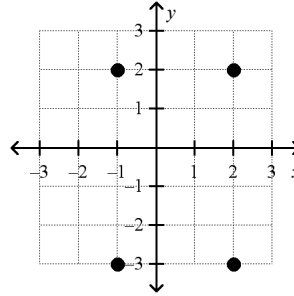
94. Mike was in charge of collecting contributions. He received contributions of \$80, \$70, \$60, \$40, and \$80. Find the mean, median, and mode.
- mean: \$70  
median: \$66  
mode: \$80
  - mean: \$66  
median: \$70  
mode: \$80
  - mean: \$80  
median: \$66  
mode: \$70
  - mean: \$80  
median: \$70  
mode: \$66

95. Name the coordinates of the points *A*, *B*, *C*, and *D*.

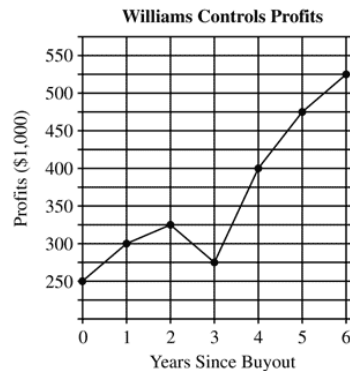


- $A(3, -3), B(4, 2), C(-2, 1), D(-5, -4)$
- $A(-3, 3), B(4, 2), C(1, -2), D(-5, -4)$
- $A(3, -3), B(2, 4), C(-2, 1), D(-4, -5)$
- $A(-3, 3), B(2, 4), C(1, -2), D(-4, -5)$

96. Find the area of the rectangle formed.



- 6
  - 15
  - 16
  - 10
97. The graph below shows the total yearly profits for Williams Controls in the years since it was bought by a larger company. Year 0 represents the year before Williams Controls was bought, year 1 represents the first year of ownership by the larger company, and so on.

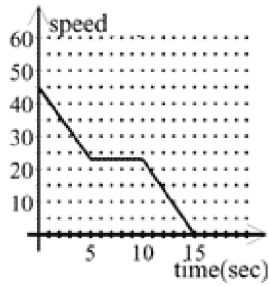


**During what year did the profits for the year increase the most?**

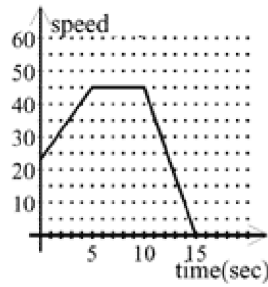
- Year 0
- Year 3
- Year 4
- Year 5

98. Which graph below would match the situation described?  
 A car travelling at 23 mi/h accelerates to 45 mi/h in 5 seconds. It maintains that speed for the next 5 seconds, and then slows to a stop during the next 5 seconds.

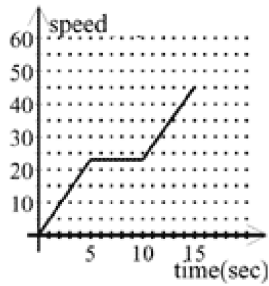
a.



c.



b.



d.

