Montana
Comprehensive Assessment
System *(MontCAS, Phase 2 CRT)*

GRADE 6
COMMON RELEASED ITEMS
SPRING 2007
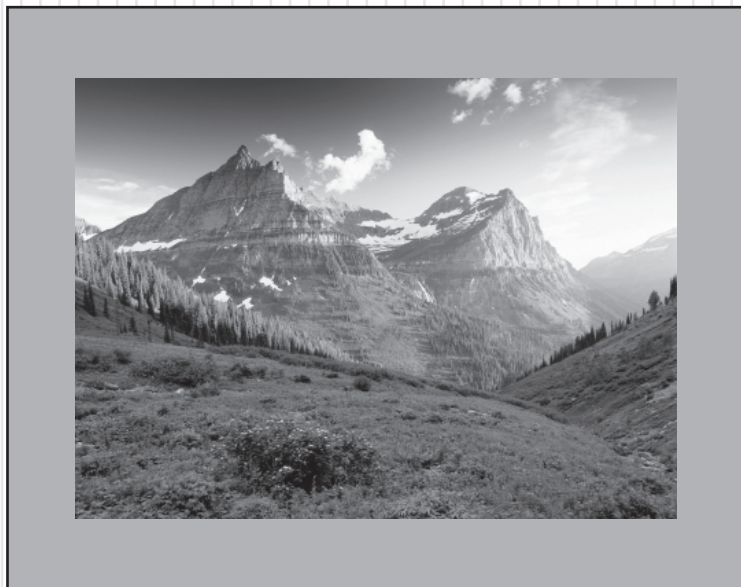
OPI

OFFICE OF PUBLIC INSTRUCTION

Mathematics
Session 1 (Calculator)

This test session includes multiple-choice questions and a question for which you must show your work or write out your answer. You may use a calculator during this session.

Mark your answers to questions 1 through 24 in the section marked "Mathematics—Session 1 (Calculator)" in your Student Response Booklet.

1. A company reported earnings of $1.247 billion last year. Which is another way of writing this number?

   A. $ 1,247,000
   B. $ 12,470,000
   C. $ 124,700,000
   D. $1,247,000,000

2. Every month, Patty will replace a different section of old fencing on her ranch. The amount of fencing she plans to replace in each of the first four months is shown below.

Month	Fencing to Be Replaced (in feet)
1	1355
2	1240
3	1125
4	1010

   The pattern of the first four months continues. How much fencing will Patty replace during the fifth month?

   A. 895 feet
   B. 575 feet
   C. 505 feet
   D. 115 feet

Use the balanced scale shown below to answer question 3.
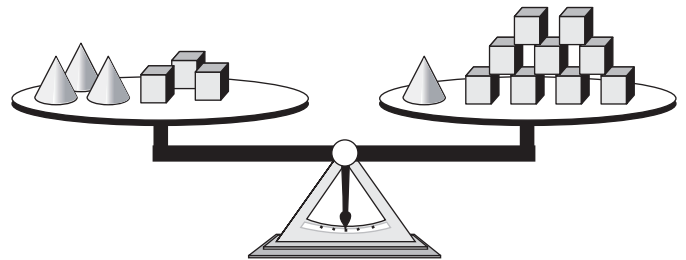
3. How many cubes will it take to balance one cone?

   A. 3
   B. 4
   C. 5
   D. 6

4. Carla created the number pattern below.
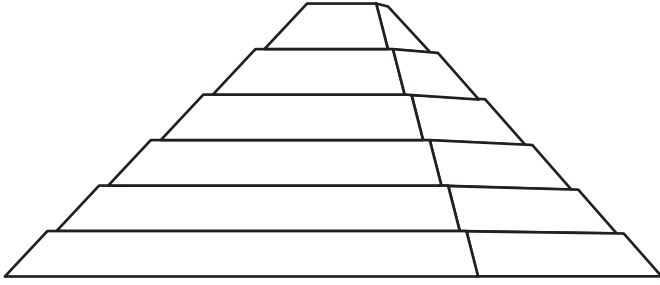
   $$6, 18, 54, 162, \ldots$$

   What would be the seventh number in Carla's pattern?

   A.   198
   B.   486
   C. 1458
   D. 4374

5. The oldest Egyptian pyramids were step pyramids, like the one shown below.

The faces of the steps outlined in the picture are best represented as trapezoids. Which statement about the trapezoids is true?

A. They are congruent.

B. Their heights are approximately equal.

C. Their bases are approximately equal.

D. Their areas are approximately equal.

6. Roger found a rectangular piece of carpet with an area of 154 square feet. One side of the piece of carpet was 14 feet long. How long was the other side?

A. 2156 feet

B.   168 feet

C.   140 feet

D.   11 feet

7. Claire's math teacher asked the class to identify the transformation on an original figure that created an image figure, as shown below.
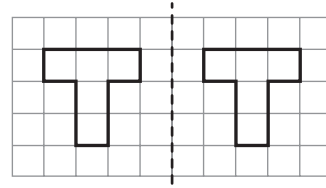
Claire answered that there were two transformations that would work. What are the two transformations?

A. a translation 5 units to the right **and** a reflection over the dotted line

B. a translation 5 units to the right **and** a 180° clockwise rotation

C. a 90° clockwise rotation **and** a reflection over the dotted line

D. a 90° clockwise rotation **and** a 180° clockwise rotation

8. At Lincoln School, student tickets to the school play cost $2 and adult tickets cost $5. If S represents the number of student tickets sold and A represents the number of adult tickets sold, the total money raised from ticket sales can be represented with this expression:
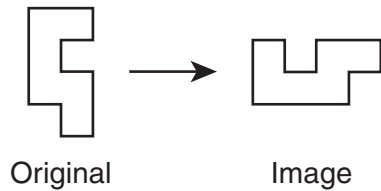
$$2S + 5A$$

How much money was raised if 140 students and 215 adults attended the play?

A. $ 355

B. $1130

C. $1355

D. $1775

Look at the transformation shown below.

Original   Image

9. Which statement describes how the original figure was transformed into the image?

    A. a 90° clockwise rotation

    B. a 90° counterclockwise rotation

    C. a reflection over a horizontal line

    D. a translation to the right

10. Bob needs to cut a 2-yard length of wood trim to finish a carpentry job, but his tape measure is labeled in inches. How many inches of wood trim does he need to cut?

    A.   24 inches

    B.   36 inches

    C.   72 inches

    D. 288 inches

11. Sally bought a rare coin for $56. Every year after her purchase, the value of the coin increases by $7. How many years will it take for the coin to be worth $119?

    A. 6

    B. 7

    C. 8

    D. 9

12. The distance, d, in miles, that a car travels in 3 hours at a speed of r miles per hour can be found using the following formula:
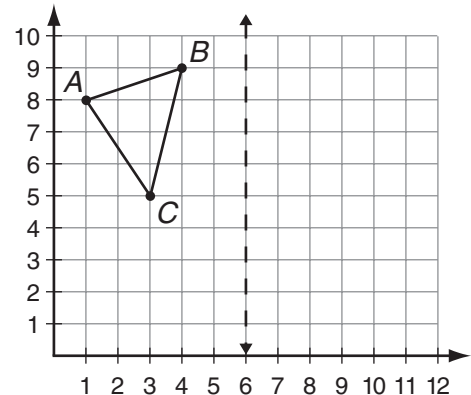
> $d = 3r$
> d = distance, in miles
> r = speed, in miles per hour

The speed, r, increases by 5 miles per hour. How many miles does the distance, d, increase?
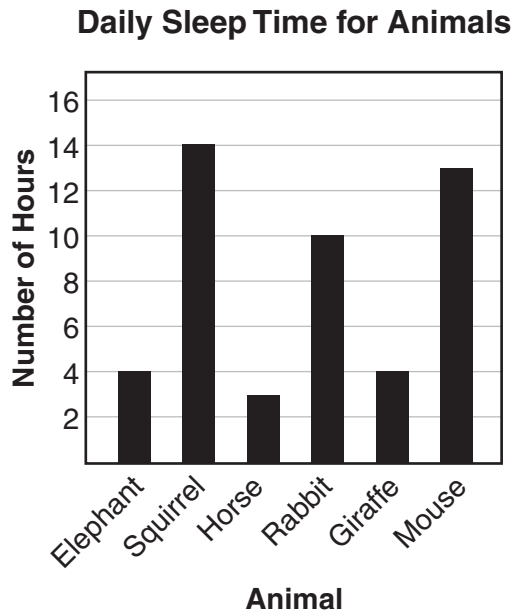
    A.   5

    B.   8

    C. 15

    D. 25

Use the diagram below to answer question 13.

13. If $\triangle ABC$ is reflected over the dotted line, what will be the new coordinates of point B?

    A. (8, 9)

    B. (9, 8)

    C. (9, 10)

    D. (10, 9)

14. The graph below shows the typical number of hours six different animals spend sleeping in a 24-hour period.

Daily Sleep Time for Animals

What is the **mean** number of hours for this set of data?

A. 4

B. 7

C. 8

D. 11

15. Twenty-four thousand five people attended a concert. Which number represents this attendance?

A. 2,405

B. 24,005

C. 24,050

D. 240,500

16. Jenna measured a wire and found that it was $5\frac{9}{16}$ inches long. Which decimal is equivalent to $5\frac{9}{16}$?

A. 5.05625

B. 5.0916

C. 5.5625

D. 5.916

17. For a science project, Angie has kept track of the weight of her new puppy over the past twelve weeks. Now she wants to display the data. Which should Angie use to **best** display her data?

A. a histogram

B. a line graph

C. a circle graph

D. a stem-and-leaf plot

18. Kevin is helping his dad build a deck. His dad needs a wrench that is larger than $\frac{5}{8}$ inch but smaller than $\frac{3}{4}$ inch. Which size wrench should Kevin choose?

A. $\frac{1}{2}$ inch

B. $\frac{7}{8}$ inch

C. $\frac{11}{16}$ inch

D. $\frac{13}{16}$ inch

19. A park has a wishing well with two fountains. One fountain shoots water every 12 seconds. The other fountain shoots water every 30 seconds. If both fountains go off at the same time, how long will it be before they go off at the same time again?

    A.   6 seconds

    B.   42 seconds

    C.   60 seconds

    D.   120 seconds

20. Kristan is tiling her bathroom floor using tiles shaped like the trapezoid below.


    4 in.

    3.5 in.

    8 in.
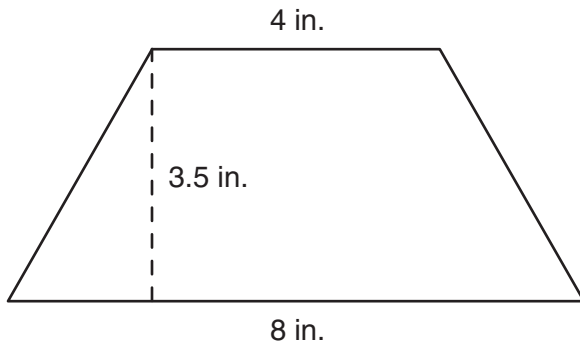
    What is the area of each tile?

    A. 10.5 square inches

    B. 21 square inches

    C. 42 square inches

    D. 56 square inches

21. Sylvia has a car with an 8-gallon gas tank. The car can travel 29 miles per gallon. How far could the car travel with a gas tank that is only $\frac{3}{4}$ full?

    A.   58 miles

    B. 116 miles

    C. 174 miles

    D. 232 miles

22. The diagram below shows the size of the garden Lawrence is planning.


    2 ft.

    6 ft.
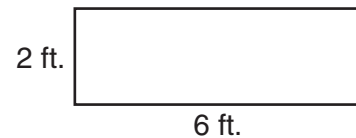
    He decides to double the length and width of the garden. How do the perimeter and area of the new plan compare with those of the old plan?

    A. The perimeter and area are both two times larger.

    B. The perimeter and area are both four times larger.

    C. The perimeter is two times larger and the area is three times larger.

    D. The perimeter is two times larger and the area is four times larger.

23. Michelle puts the 12 tiles shown below in a bag.
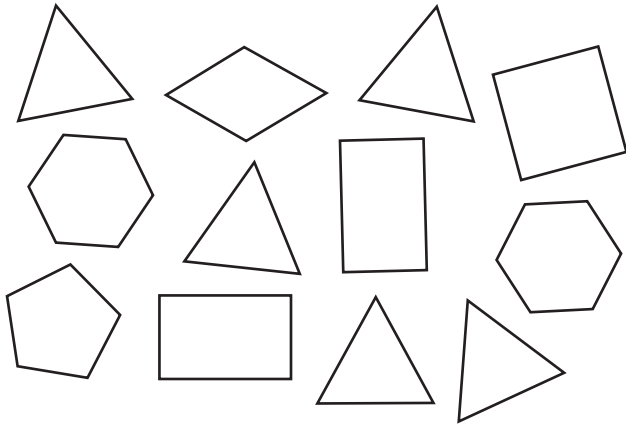
Michelle takes a tile from the bag without looking. What is the probability that she will pick a tile with exactly 4 sides?

A. $\dfrac{1}{4}$

B. $\dfrac{4}{12}$

C. $\dfrac{4}{8}$

D. $\dfrac{8}{12}$

24. A beam of light from a star in the Milky Way travels across the galaxy. What type of geometric model **best** represents the path of the light from the star?

A. point

B. ray

C. line segment

D. line

Write your answer to question 25 in the space provided for it in your Student Response Booklet.

25. Andrew finds a 22-ounce box of cereal that costs $1.63. The same cereal is also available in a 40-ounce box for $3.04.

a. If Andrew buys the 22-ounce box of cereal, how much will he be paying per ounce? Show or explain how you found your answer.

b. Will Andrew get a better deal if he buys the 40-ounce box of cereal? Show or explain how you found your answer.

Please STOP. Do not go on to the next page. STOP

Mathematics
Session 2A (Calculator)

This test session includes multiple-choice questions. You may use a calculator during this session.

Mark your answers to questions 26 through 30 in the section marked "Mathematics—Session 2A (Calculator)" in your Student Response Booklet.

26. The table below shows the tuition for four-year public colleges and universities in a certain state.

School	Tuition
Eastern University	$3,405
Northwest State	$2,865
Technical Institute	$3,491
College of Art & Science	$3,521
Western State	$2,723

What is the median tuition for these schools?

A. $2,865
B. $3,405
C. $3,491
D. $3,521

27. The movie screen at a museum has an area of 3000 square feet. Which is most likely the height of the screen?

A. 50 square inches
B. 50 inches
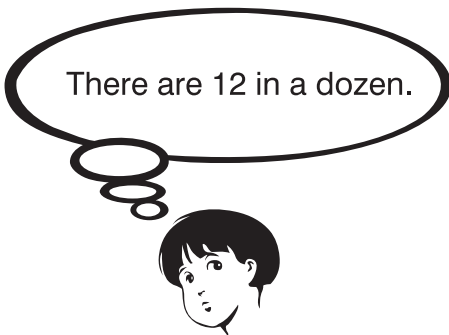C. 50 square feet
D. 50 feet

28. The scale shown below is balanced.
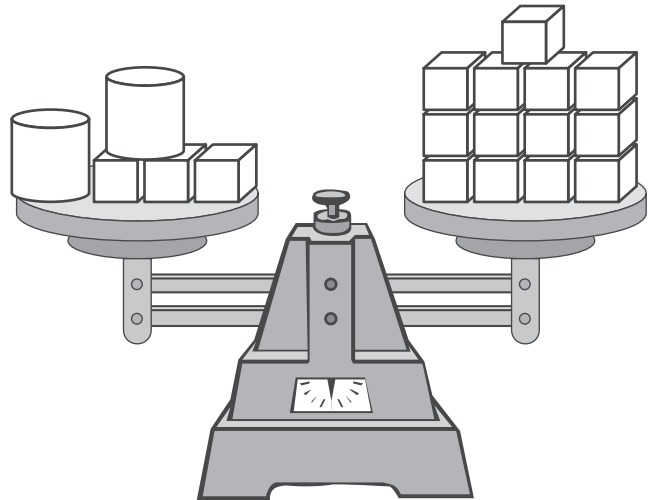
How many cubes weigh the same as one cylinder?

A. 10 cubes
B. 8 cubes
C. 5 cubes
D. 3 cubes

29. On Tuesday, the cafeteria sold 16 dozen cookies. Each cookie sold for 50¢. It costs $1.20 to make one dozen cookies. How much money did the cafeteria make after they paid their expenses?

There are 12 in a dozen.

A. $ 27.20
B. $ 76.80
C. $ 96.00
D. $134.40

30. Mark is deciding which outfit to wear. These are his choices.

- Tie: Blue, red, or stripes
- Shirt: White or blue
- Pants: Blue or tan

An outfit consists of a tie, a shirt, and a pair of pants. How many different outfits can Mark make?

A. 6 outfits
B. 7 outfits
C. 10 outfits
D. 12 outfits

Please STOP. Do not go on to the next page. STOP

This test session includes multiple-choice questions. You may NOT use a calculator during this session.

Mark your answers to questions 35 through 39 in the section marked "Mathematics—Session 2B (No Calculator)" in your Student Response Booklet.

35. Pat bought 5 pens for $2.00. Jesse wants to buy 12 of the same kind of pens. How much will they cost?

    A. $3.60

    B. $4.40

    C. $4.80

    D. $6.00

36. Jack filled a 2-gallon bucket with water in 1 minute. Using the same faucet, how full can he fill a 100-gallon tank in 10 minutes?

    A. $\frac{1}{2}$ full

    B. $\frac{1}{4}$ full

    C. $\frac{1}{5}$ full

    D. $\frac{1}{20}$ full

37. The newspaper reported the amount of rainfall in four cities for one day in April.
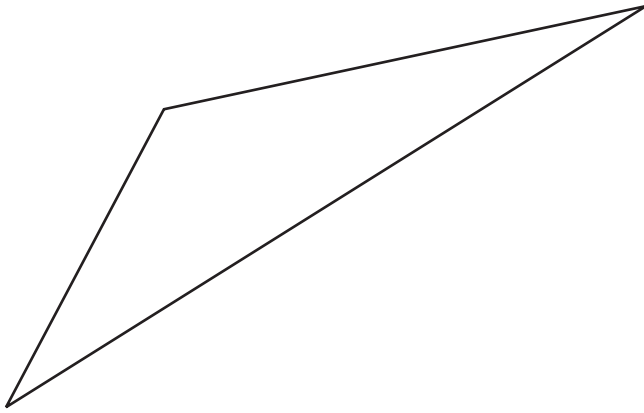
City	Amount of Rainfall (inches)
Capital City	0.55
Fryeburg	0.7
Parkton	0.35
Waterville	0.08

Which city received the most rain?

    A. Capital City

    B. Fryeburg

    C. Parkton

    D. Waterville

38. What is the measure of the smallest angle of the triangle?

    A. 20°

    B. 30°

    C. 40°

    D. 50°

39. Look at the pattern shown in the table below.

Input Number (n)	Output Number (s)
1	3
2	5
3	7
4	9

Which equation shows the relationship between the input number, n, and the output number, s?

    A. $s = 3n$

   B. $s = n + 2$

    C. $s = 3n - 1$

    D. $s = 2n + 1$

Mathematics
Session 3 (No Calculator)

This test session includes multiple-choice questions and questions for which you must show your work or write out your answer. You may NOT use a calculator during this session.

Mark your answers to questions 44 through 64 in the section marked "Mathematics—Session 3 (No Calculator)" in your Student Response Booklet.

44. The points *P*, *Q*, and *R* on the coordinate plane below are three vertices of a square.
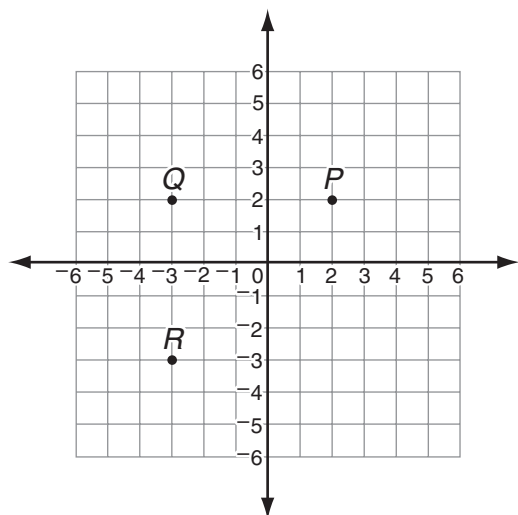
What are the coordinates of the fourth vertex?

A. (2, –2)

B. (2, –3)

C. (3, –2)

D. (3, –3)

45. A recipe for punch says to mix 3 parts ginger ale with 5 parts fruit juice. Which mixture satisfies this 3:5 ratio?

A. 4 cups of ginger ale, 6 cups of fruit juice

B. 6 liters of ginger ale, 8 liters of fruit juice

C. 6 quarts of ginger ale, 10 quarts of fruit juice

D. 8 gallons of ginger ale, 15 gallons of fruit juice

46. Mandy used a coupon for a purchase at her favorite store. She paid a total of $15. Her purchase is represented by the equation below.
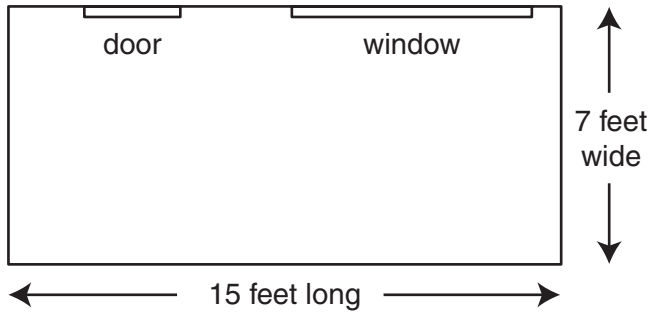
$$C = P - 4$$
$$C = \text{total price}$$
$$P = \text{original price}$$

What was the original price of Mandy's purchase?

A. $ 9

B. $11

C. $16

D. $19

47. Brad created the design for a porch as shown below.

door   window

7 feet wide

15 feet long

He decides to make the width of the porch twice as large as it is in the original design. Which statement is true about the new design?
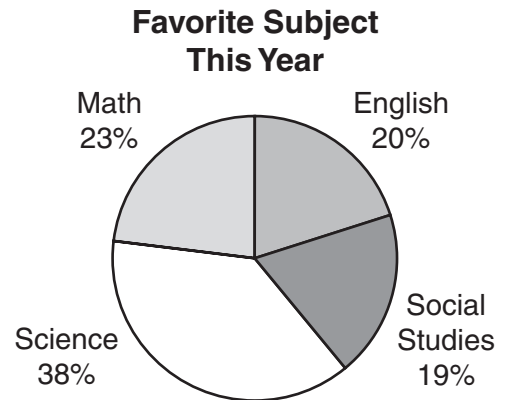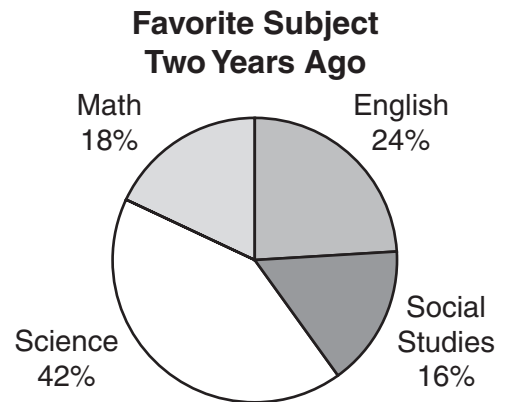
A. It increases the perimeter of the porch by 7 feet.

B. It increases the area of the porch by 7 square feet.

C. It doubles the perimeter of the porch.

D. It doubles the area of the porch.

48. Opal wrote a computer program to create a new secret pass code for her computer files each week. The first three pass codes are shown in the table below.

Week	Pass Code
1	5-7-4
2	10-14-8
3	15-21-12

If the pattern in the table continues, what will be the next pass code?

A. 20-28-16

B. 15-14-20

C. 20-24-16

D. 18-24-15

49. The sixth-grade students at Miller School were surveyed two years ago and again this year about their favorite subject. The graphs below show the results.

**Favorite Subject
Two Years Ago**

Math 18%
English 24%
Social Studies 16%
Science 42%

**Favorite Subject
This Year**

Math 23%
English 20%
Social Studies 19%
Science 38%

Which statement is a reasonable conclusion based on the two graphs?

A. English is harder than it was two years ago.

B. English has become more popular in the last two years.

C. Math is more fun to do than it was two years ago.

D. Math increased the most in popularity in the last two years.

50. In science class, Cyan's model boat held 2817 grams of marbles before it sank. How many kilograms of marbles did Cyan's boat hold?

A.   0.2817

B.   2.817

C.   28.17

D. 281.7

51. This year, Mr. Mussina charges $6 for a spaghetti dinner at his restaurant. He plans to increase the price by $0.25 each following year. If x represents the number of years, which expression represents the cost of a spaghetti dinner in x years?

A. $6(0.25) + x$

B. $6 + x + 0.25$

C. $6x + 0.25$

D. $6 + 0.25x$

52. Two proper fractions are multiplied together. Both fractions are between $\frac{1}{2}$ and 1. Which statement describes the product?

A. The product is less than 1.

B. The product is equal to 1.

C. The product is between 1 and 2.

D. The product is greater than 2.

53. Carroll is designing a board game. The pieces that the players will move on the board will be square pyramids like the one shown below.
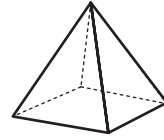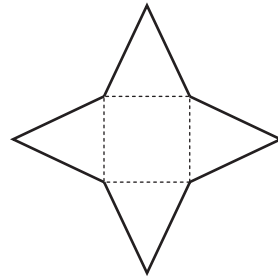

Which figure can be folded along the dotted lines to create a pyramid for Carroll's game?
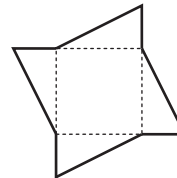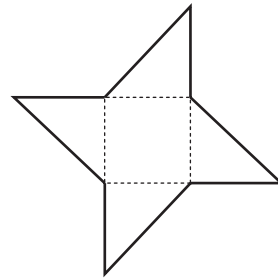
A.
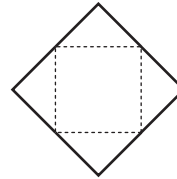
B.

C.

D.

54. Sam surveyed his friends and found that 7 out of 10 have a pet. What percent of Sam's friends have a pet?

A. 0.07%

B. 0.7%

C. 7%

D. 70%
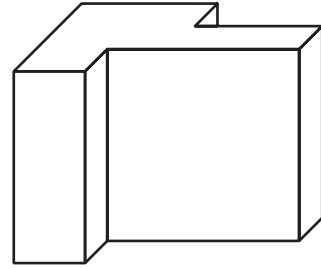
55. Which type of figure is **always** a rectangle?

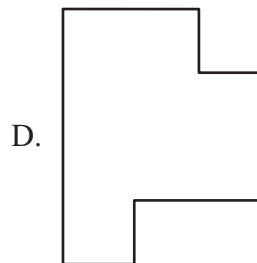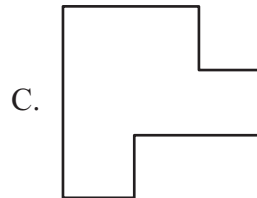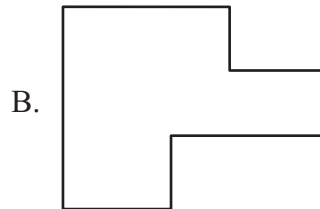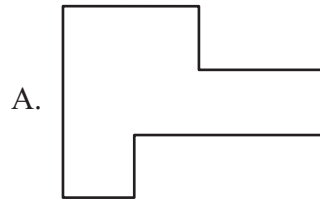A. parallelogram

B. square

C. trapezoid

D. quadrilateral

56. A history test consisted of 50 questions. Chris answered 86% of the questions correctly. How many questions did he answer correctly?

A. 7

B. 40

C. 43

D. 45

57. Aaron built the model of an office building shown below.

Which figure **best** represents the shape of the roof of the building?

A.

B.

C.

D.

58. One of Alex's model train engines is 5 inches long. Every $\frac{1}{2}$ inch on the model engine represents 2 feet on a real engine. According to the model, what is the length of a real train engine?

A. 2.5 feet
B. 5 feet
C. 10 feet
D. 20 feet

59. A juice company researched the sales of its five most popular juice flavors. The results are shown in the graph below.
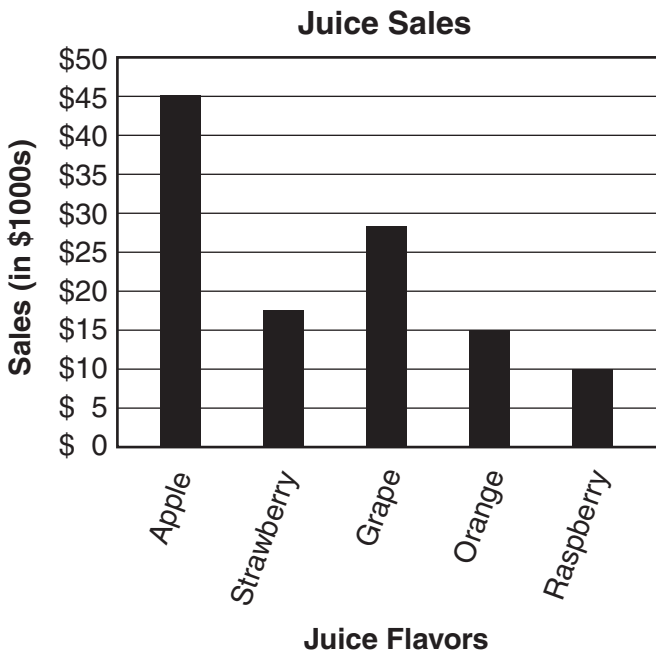
Juice Sales

Which two juice flavors have combined sales equal to the sales of apple juice?

A. strawberry and grape
B. strawberry and orange
C. grape and raspberry
D. orange and raspberry

60. Matt is buying a new bike. He can choose from the types and colors listed in the table below.

Bikes

Type	Color
road	red
	gold
mountain	black

For his bike, Matt will choose one type and one color. Which organized list shows **all** the different bikes from which he can choose?

A.
road, red
mountain, gold
mountain, black

B.
road, red
road, gold
mountain, black

C.
road, red
road, gold
mountain, gold
mountain, black

D.
road, red
road, gold
road, black
mountain, red
mountain, gold
mountain, black

61. The graph below shows how high a ball is expected to bounce when dropped from various heights.

Height of Drop (feet)
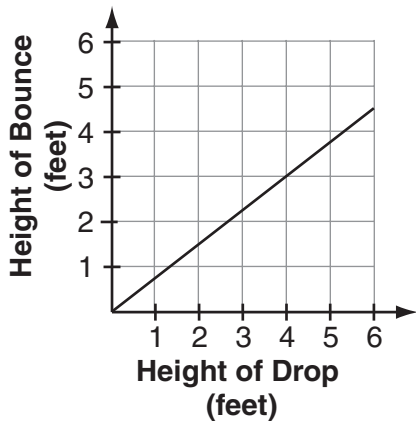
Based on this graph, which statement is true?

A. The ball bounces to $\frac{3}{4}$ the height from which it is dropped.

B. The ball bounces to $\frac{4}{3}$ the height from which it is dropped.

C. The ball bounces to a height 1 foot less than that from which it is dropped.

D. The ball bounces to a height 1 foot more than that from which it is dropped.

62. At a movie, 72% of the people in the audience were female. There were 150 people at the movie. How many were female?

A. 48

B. 78

C. 108

D. 128

63. Alan is creating a survey to learn about the homework his classmates are assigned. Which question would provide him with the **best** information about the amount of homework his classmates do?

A. Do you think you get too much homework each night?

B. Did you work on your homework for more than two hours yesterday?

C. In which subject is your homework the easiest?

D. How much time did you spend working on your homework this Monday?

64. The number sentence below was created by applying the associative property of multiplication.

$$6 \times (5 \times 3) \times 4 = (6 \times n) \times 12$$

Which value of n will make the number sentence true?

A. 3

B. 5

C. 12

D. 15

Write your answers to questions 65 through 67 in the spaces provided in your Student Response Booklet. Show all of your work.

65. Compute:

$$16.2 \times 1.1$$

66. Compute:

$$\frac{1}{8} \div \frac{1}{4} + \frac{1}{2}$$

67. Compute:

$$33 + 2 \times 5 - 4$$

Write your answer to question 68 in the space provided for it in your Student Response Booklet. Show all of your work.

68. The table below shows the six states with the most members in the U.S. House of Representatives.

State	Number of Representatives
California	53
Florida	25
Illinois	19
New York	29
Pennsylvania	19
Texas	32

a. Create a bar graph showing the number of representatives from each state listed in the table. Be sure to completely label both axes.

b. Franco made a line graph of the data. His graph is shown below.

U.S. House of Representatives
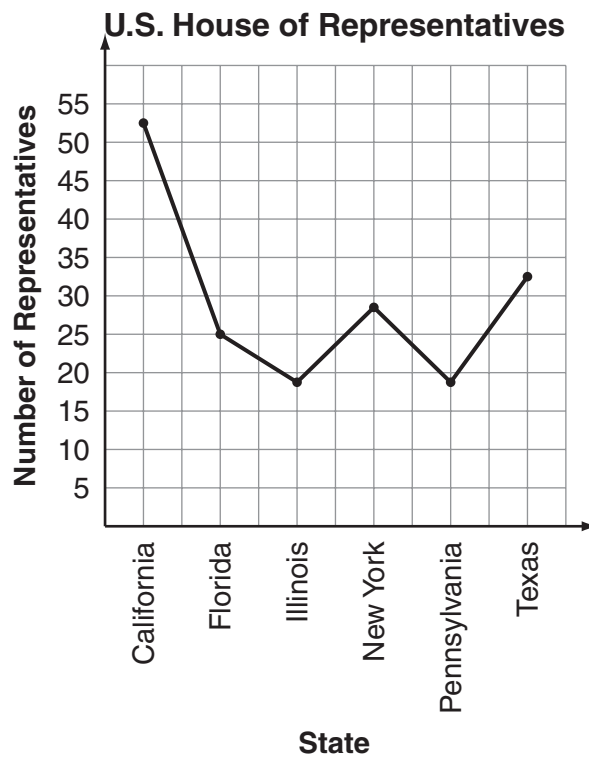
Give a complete explanation as to why Franco's graph is not an appropriate representation of the data in the table.

Please STOP. STOP