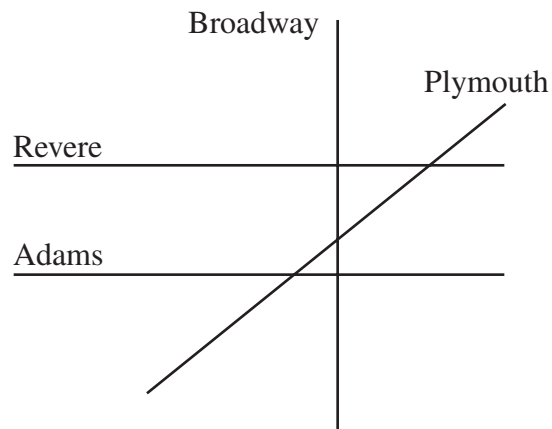## Session 1, Multiple-Choice Questions

1 Which of these numbers is evenly divisible by 3?

A. 1,587,039

B. 1,687,093

C. 2,578,031

D. 2,687,096

Reporting Category for Item 1: **Number Sense and Operations**
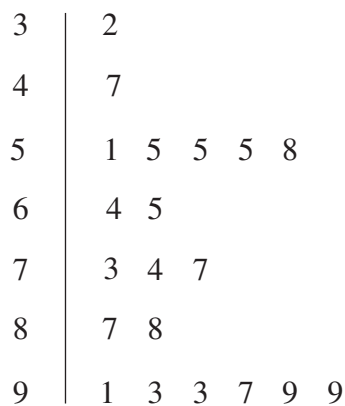
Use the map below to answer question 2.

2 Which two streets on the map above appear to be parallel?

A. Broadway and Adams

B. Broadway and Plymouth

C. Adams and Plymouth

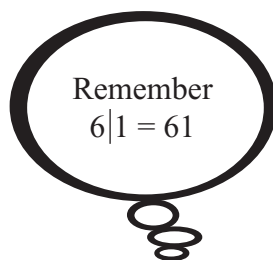D. Adams and Revere

Reporting Category for Item 2: **Geometry**

3 The stem-and-leaf plot below shows how a class of sixth-graders scored on a math test.

Sixth-Grade Math Scores

3	2
4	7
5	1 5 5 5 8
6	4 5
7	3 4 7
8	7 8
9	1 3 3 7 9 9

A score of 63 or higher is passing. How many sixth-graders passed this math test?

Remember
$6|1 = 61$

A. 7

B. 13

C. 11

D. 17

Reporting Category for Item 3: *Data Analysis, Statistics, and Probability*

4 Sara hired her brother James to help her sell lemonade. Sara agreed to pay James $1.00, plus $0.10 for each glass of lemonade that he sold. Sara paid James $3.60. How many glasses of lemonade did James sell?

A. 26

B. 36

C. 46

D. 56

*Reporting Category* for Item 4: ***Patterns, Relations, and Algebra***

5 Teresa is covering the floor of her kitchen with tiles. Each square tile covers 4 square feet. If her kitchen floor is a rectangle measuring 16 feet by 10 feet, how many tiles will she need?

A. 13

B. 26

C. 30

D. 40

Reporting Category for Item 5: ***Measurement***

Use the spinner below to answer question 6.

6 Ramón is going to spin the arrow on the spinner twice and add the results.
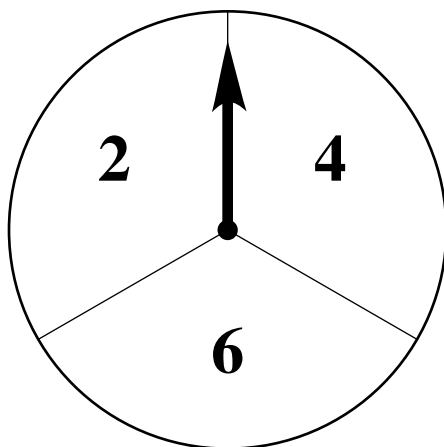
What is the **most likely** sum of the two spins?

A. 6

B. 8

C. 10

D. 12

*Reporting Category* for Item 6: ***Data Analysis, Statistics, and Probability***

7 Earth's atmosphere is 78.08% nitrogen and 20.95% oxygen. What percent of Earth's atmosphere is made up of gases other than nitrogen and oxygen?

A. 0.0097

B. 0.097

C. 0.97

D. 97

Reporting Category for Item 7: ***Number Sense and Operations***

Mathematics, Grade 6

8 Each of the 6 small squares in the figure below measures 1 inch on each side.
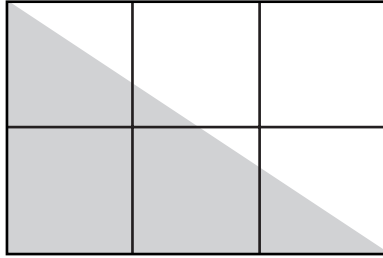
Which of the following is **closest** to the area of the shaded portion of the figure?

A. 2 square inches

B. 3 square inches

C. 4 square inches

D. 5 square inches

Reporting Category for Item 8: **Measurement**

9 The line below shows the locations of three towns on a highway.

Westfield   Springfield   Palmer

The distance from Westfield to Springfield is 10 miles, and the distance from Westfield to Palmer is 25 miles. What is the distance, in miles, from Springfield to Palmer?
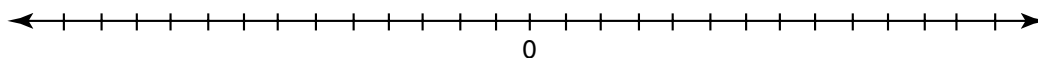
A. 15

B. 20

C. 30

D. 35

Reporting Category for Item 9: **Geometry**

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Session 1, Open-Response Question

Use the number line below to answer question 10.

10 a. Draw a number line like the one above in your Student Answer Booklet. Correctly position the following set of integers beneath the marks on your number line.

$$+10, -3, +6, +1, -9, -6$$

b. Explain why you decided where to place -3 on your number line.

c. Which number is greater: -10 or $+3$? Explain your answer.

d. Which number is greater: -3 or -6? Explain your answer.

Reporting Category for Item 10: **Number Sense and Operations**

Session 1, Short-Answer Questions 🚫

11 Liam is playing a game with a deck of colored cards. The chart below shows the number of cards of each color in the deck.

Liam's Cards

Color of Cards	Number of Cards
Blue	2
Green	3
Red	5
Yellow	1
Orange	1

If Liam draws one card without looking, what is the probability he will draw a green card?

Reporting Category for Item 11: **Data Analysis, Statistics, and Probability**

12 The approximate costs of running an automobile in 1994 are shown in the chart below.

Automobile Costs in 1994

Item	Amount
Gas and Oil	$750
Other	$2,250
Total Cost	$3,000

What fraction would represent the ratio of the cost of gas and oil to the total cost of running a car in 1994? Write your fraction in simplest form.
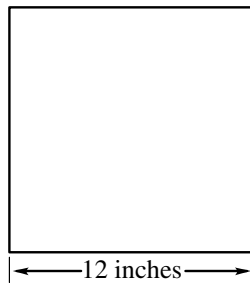
Reporting Category for Item 12: **Number Sense and Operations**

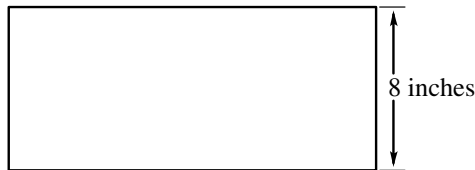## Session 1, Open-Response Question 🚫📱

13 Todd, Chi, and Janet are making posters for art class. They decide that each poster will have the same area, but different dimensions.
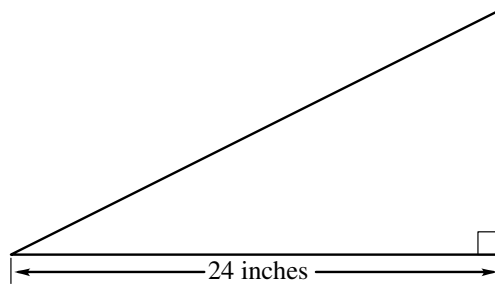
Todd makes his poster on a square with a side that measures 12 inches.

|←——12 inches——→|

Chi wants to make his poster on a rectangle with a width of 8 inches.

8 inches

Janet will use a right triangle with a base of 24 inches.

←———— 24 inches ————→

a. What is the area of Todd's square? Show or explain your work.

b. What would the length of Chi's rectangle need to be in order for the rectangle to have the same area as Todd's square? Show or explain your work.

c. What would the height of Janet's triangle need to be in order for the triangle to have the same area as Todd's square? Show or explain your work.
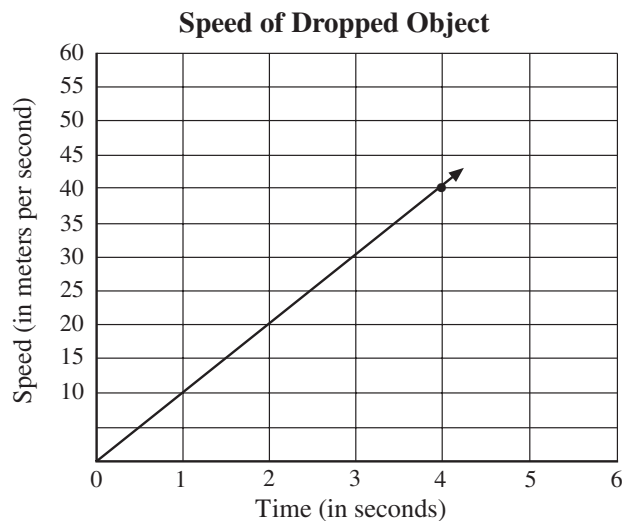
Reporting Category for Item 13: **Measurement**

Session 1, Multiple-Choice Questions

14 Maria charges $5.00 to mow a lawn, plus $6.00 per hour. Maria uses the equation $C = 5 + 6h$ to determine C, the amount of money she charges for mowing lawns. If h represents the number of hours it takes to mow a lawn, how much money will Maria charge if she mows a lawn for 3 hours?

A. $11.00

B. $14.00

C. $21.00

D. $23.00

Reporting Category for Item 14: **Patterns, Relations, and Algebra**

15 The graph below shows the speed of a dropped object over time.

Speed of Dropped Object

Based on the graph, what will be the approximate speed of the dropped object after 5 seconds?

A. 5 meters per second

B. 25 meters per second

C. 50 meters per second

D. 75 meters per second

Reporting Category for Item 15: **Patterns, Relations, and Algebra**

16 The table shows the temperature on four winter mornings in the Berkshire Mountains.

**Winter Temperatures
in the Berkshire Mountains**

Date	Temperature at 6:00 A.M.
Thursday	–9˚C
Friday	–10˚C
Saturday	–18˚C
Sunday	–12˚C

Which day had the warmest morning?

A. Thursday

B. Friday

C. Saturday

D. Sunday

Reporting Category for Item 16: **Number Sense and Operations**

Session 1, Open-Response Question 🚫

17 A group of students measured their heights for a class project. The results are shown in the table below.

Students' Heights

Student	Height in Centimeters
Victor	132
Tim	142
Jackie	147
Jani	141
Bill	153
Ellen	147
Maureen	135

a. What is the mode of the students' heights?

b. Copy the stem-and-leaf plot below into your Student Answer Booklet. Correctly complete the stem-and-leaf plot by entering the remaining heights. Victor's height is already shown.

Heights (in centimeters)

```
15 |
14 |
13 |  2
```

c. What is the median height of the students? Show or explain your work.

d. Later, two more students joined the group; their heights were added to the table. This did **not** change the median height of all nine students. What must have been correct about the heights of these two students? Show or explain your work.

Reporting Category for Item 17: ***Data Analysis, Statistics, and Probability***

Session 2, Multiple-Choice Questions

18 Lily designed the kite below for an experiment.
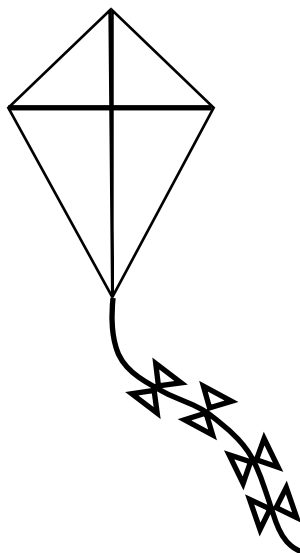
Which of the following correctly describes the shape of Lily's kite?

A. triangle

B. rectangle

C. parallelogram

D. quadrilateral

Reporting Category for Item 18: **Geometry**

Use the table below to answer question 19.

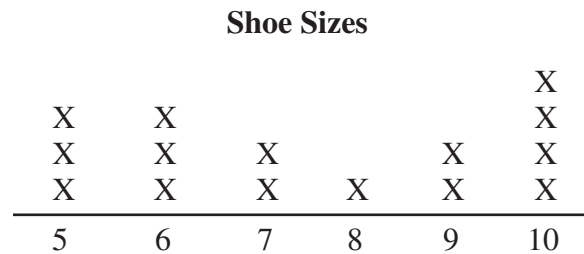| x	y
5	25
10	50
12	?
17	85

19 According to the pattern shown, what is the value of *y* when *x* is 12?

A. 55

B. 60

C. 75

D. 100

Reporting Category for Item 19: ***Patterns, Relations, and Algebra***

20 Han surveyed 15 of her classmates to find their shoe sizes. She displayed the data in the line plot below.

Shoe Sizes

```
                                 X
  X     X                        X
  X     X     X              X    X
  X     X     X     X        X    X
 ─────────────────────────────────
  5     6     7     8     9    10
```

What is the median shoe size?

A. 5

B. 6

C. 7

D. 10

Reporting Category for Item 20: **Data Analysis, Statistics, and Probability**

21 Dolores bought a package of corn seeds. She wanted to use all the seeds in the package to plant two or more rows of corn with the same number of seeds in each row, but she found that this was **not** possible. Which of the following could have been the number of seeds in the package?

A. 32

B. 33

C. 35

D. 37

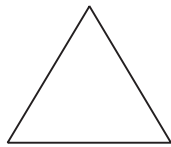*Reporting Category* for Item 21: **Number Sense and Operations**

Use the ruler provided on your reference sheet to answer question 22.

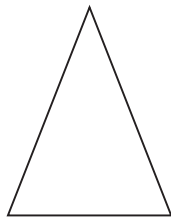**22** Sherrie is sewing a costume for a party. She is using the pattern shown below.
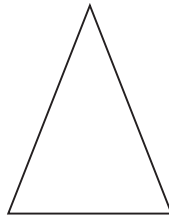
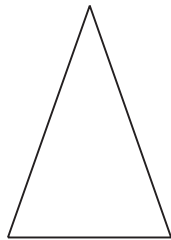Which of the following pieces of cloth is congruent to the pattern?

A.

B.

C.

D.

Reporting Category for Item 22: **Geometry**

23 Cai bought popcorn for herself and 2 friends, plus a drink only for herself. The popcorn cost $2 for each person, and the total cost for Cai's purchase was $7.50. If d is the cost of a drink, which equation below could be used to determine the cost of Cai's drink?

A. $2 + d = \$7.50$

B. $2 + 2d = \$7.50$

C. $3(2) + d = \$7.50$

D. $3(2) + 3d = \$7.50$

*Reporting Category* for Item 23: **Patterns, Relations, and Algebra**

24 Sylvia and Tomás are playing a game of chess. Each player began the game with 16 pieces. Now Sylvia has $\frac{1}{4}$ of her pieces remaining on the board and Tomás has $\frac{1}{8}$ of his pieces remaining on the board. How many total pieces remain on the board?

A. 4

B. 6

C. 8

D. 12

Reporting Category for Item 24: **Number Sense and Operations**

25 The graph below shows the average height of plants based on a specific number of hours of sunlight received daily.

Average Height of Plants

Height (in inches)

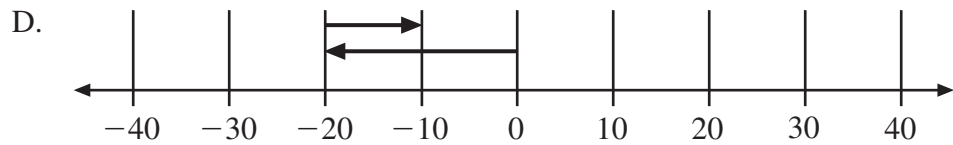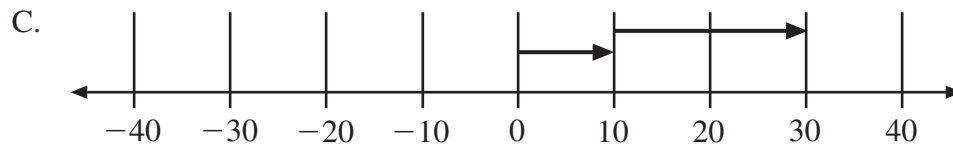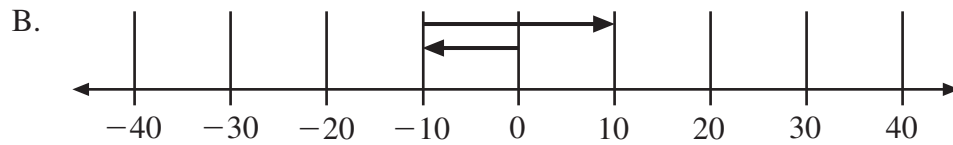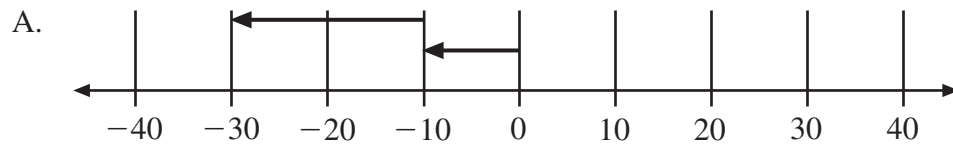Number of Hours of Sunlight Received Per Day
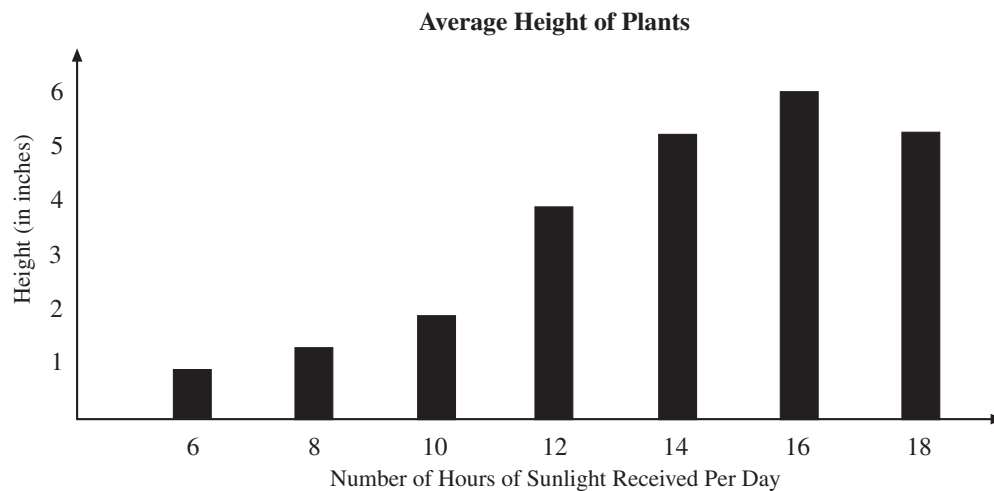
According to the graph, which of the following is a true statement?

A. The average height of the plants is taller with 16 hours of sunlight per day than with 14 hours of sunlight per day.

B. The average height of the plants is taller with 12 hours of sunlight per day than with 14 hours of sunlight per day.

C. The average height of the plants cannot be taller than 3 inches with less than 18 hours of sunlight per day.

D. The plants grow taller as the number of hours of sunlight the plants receive increases.

Reporting Category for Item 25: ***Patterns, Relations, and Algebra***

26 Which number line below **best** represents the addition problem $-10 + (-20) = \square$?

A.

B.

C.

D.

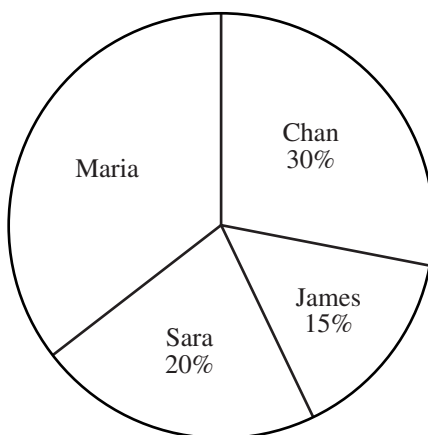## Session 2, Open-Response Question

27 Jody is making the circle graph below to show the results of the election for the sixth-grade class president. There are 520 students in the sixth grade. All 520 students voted. Each student voted for only one of four candidates.

Results of Sixth-Grade Class Election

a. What percent of the votes did Maria receive? Show or explain your work.

b. How many students voted for James? Show or explain your work.

c. How many more students voted for Chan than for Sara? Show or explain your work.

d. If the class size increases to 640, how many votes would Maria need to receive 40 percent of the votes? Show or explain your work.

Reporting Category for Item 27: **Number Sense and Operations**

28 What value of p makes the equation below true?

$$3p + 1 = 13$$

$3p$ means 3 times p

Reporting Category for Item 28: **Patterns, Relations, and Algebra**

29 Rosa volunteered at a local nursing home for 20 days. She worked for $1\frac{1}{4}$ hours each day. How many total hours did Rosa volunteer at the nursing home?

Reporting Category for Item 29: **Measurement**

30 What is the value of the following expression?

$$1 + 2 \times (3 - 1)$$

Reporting Category for Item 30: **Number Sense and Operations**

Session 2, Open-Response Question

31 A booth at the State Fair is offering pony rides for children. The table below shows the relationship between the number of rides a child takes and the cost of the rides.

Pony Rides

Number	Cost
1	$2.00
2	$2.50
3	$3.00
4	$3.50
5	?
10	?

a. If the pattern continues in the same way, what is the cost for 5 rides and the cost for 10 rides?

b. Francie had $5.50 to spend. What is the **greatest** number of rides she could take? Explain how you found your answer.

c. Write an expression using n to show the cost of n rides.

Reporting Category for Item 31: ***Patterns, Relations, and Algebra***

Session 2, Multiple-Choice Questions

32 The chart below lists the times it took four students to run the 50-yard dash.

| Student	Time
Pete	14.4 seconds
Sam	14.05 seconds
John	14.37 seconds
Carlos	13.9 seconds

Which shows the students in order from fastest to slowest?

A. Pete, Sam, Carlos, John

B. Carlos, John, Sam, Pete

C. Pete, Carlos, Sam, John

D. Carlos, Sam, John, Pete

Reporting Category for Item 32: ***Number Sense and Operations***

33 A local charity group made paper flowers for a craft fair. The graph below shows their profit based on the number of flowers sold.

Paper Flower Profits
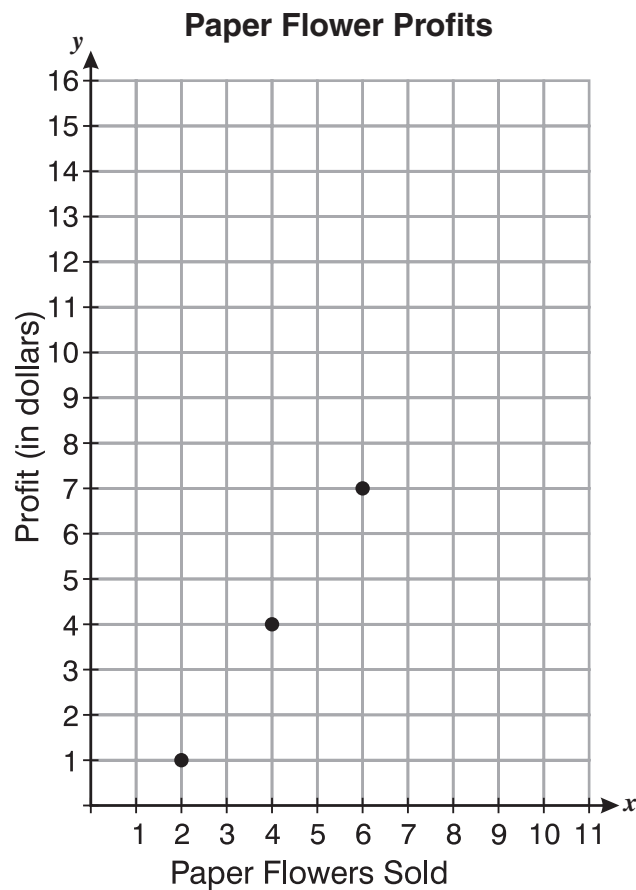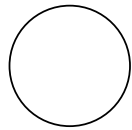

If the relationship shown by the graph continues, what would the profit be if the group sold 10 flowers?

A. $13

B. $14

C. $15

D. $16

34 A new sculpture was built in a city park. The diagrams below show the top view and the side view of the sculpture.
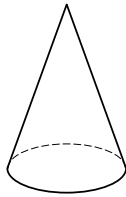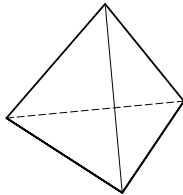
Top View

Side View

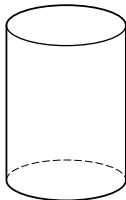Which of the following pictures **best** shows the shape of the sculpture?

A.

B.

C.

D.
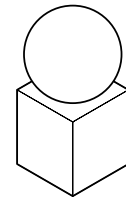
35 Admission to the Basketball Hall of Fame in Springfield is $5.00 per student. A group of students bought admission tickets. One student spent an extra $9.00 for a poster. The total amount they spent was $34.00. How many students were in the group?

A. 4

B. 5

C. 6

D. 7

Reporting Category for Item 35: ***Patterns, Relations, and Algebra***

36 Uri read that a bicycle tire has a radius of 30 centimeters and a diameter of 50 centimeters. How does Uri know that these measurements **cannot** be correct?

A. The radius should be twice the diameter.

B. The diameter should be twice the radius.

C. The radius should be 30π centimeters.

D. The diameter should be 50π centimeters.

Reporting Category for Item 36: ***Measurement***

37 Shani saved three times as much money as Bill. If Bill saved d dollars, which expression shows how much money Shani saved?

A. $3d$

B. $\dfrac{d}{3}$

C. $d + 3$

D. $d - 3$

*Reporting Category* for Item 37: ***Patterns, Relations, and Algebra***

38 On Kenesha's last business trip she drove 820 miles. Her company pays her $0.32 per mile. Which of the following is **closest** to the amount Kenesha's company will pay her for the miles she drove?

A. $\frac{1}{4}$ of 800

B. $\frac{1}{3}$ of 800

C. $\frac{1}{4}$ of 900

D. $\frac{1}{3}$ of 900

Reporting Category for Item 38: **Measurement**

39 An architect measured the three angles marked in the diagram below.
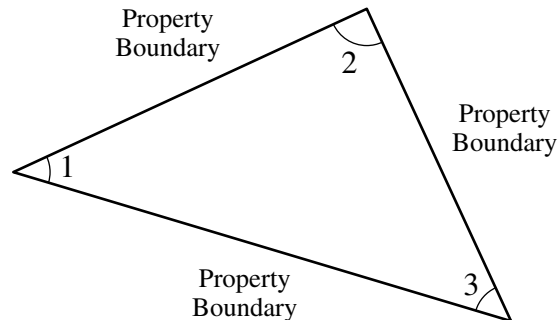
What was the sum of the measures of the three angles?

A. 180°

B. 210°

C. 270°

D. 360°

Reporting Category for Item 39: **Measurement**