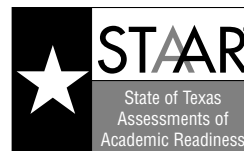


GRADE 8
Mathematics

Administered April 2014

RELEASED

STAAR GRADE 8 MATHEMATICS REFERENCE MATERIALS



Inches



LENGTH

Customary

1 mile (mi) = 1,760 yards (yd)

1 yard (yd) = 3 feet (ft)

1 foot (ft) = 12 inches (in.)

Metric

1 kilometer (km) = 1,000 meters (m)

1 meter (m) = 100 centimeters (cm)

1 centimeter (cm) = 10 millimeters (mm)

VOLUME AND CAPACITY

Customary

1 gallon (gal) = 4 quarts (qt)

1 quart (qt) = 2 pints (pt)

1 pint (pt) = 2 cups (c)

1 cup (c) = 8 fluid ounces (fl oz)

Metric

1 liter (L) = 1,000 milliliters (mL)

WEIGHT AND MASS

Customary

1 ton (T) = 2,000 pounds (lb)

1 pound (lb) = 16 ounces (oz)

Metric

1 kilogram (kg) = 1,000 grams (g)

1 gram (g) = 1,000 milligrams (mg)

TIME

1 year = 12 months

1 year = 52 weeks

1 week = 7 days

1 day = 24 hours

1 hour = 60 minutes

1 minute = 60 seconds

STAAR GRADE 8 MATHEMATICS REFERENCE MATERIALS

CIRCUMFERENCE

Circle $C = 2\pi r$ or $C = \pi d$

AREA

Triangle $A = \frac{1}{2}bh$

Rectangle or parallelogram $A = bh$

Trapezoid $A = \frac{1}{2}(b_1 + b_2)h$

Circle $A = \pi r^2$

SURFACE AREA

	Lateral	Total
Prism	$S = Ph$	$S = Ph + 2B$
Pyramid	$S = \frac{1}{2}Pl$	$S = \frac{1}{2}Pl + B$
Cylinder	$S = 2\pi rh$	$S = 2\pi rh + 2\pi r^2$

VOLUME

Prism or cylinder $V = Bh$

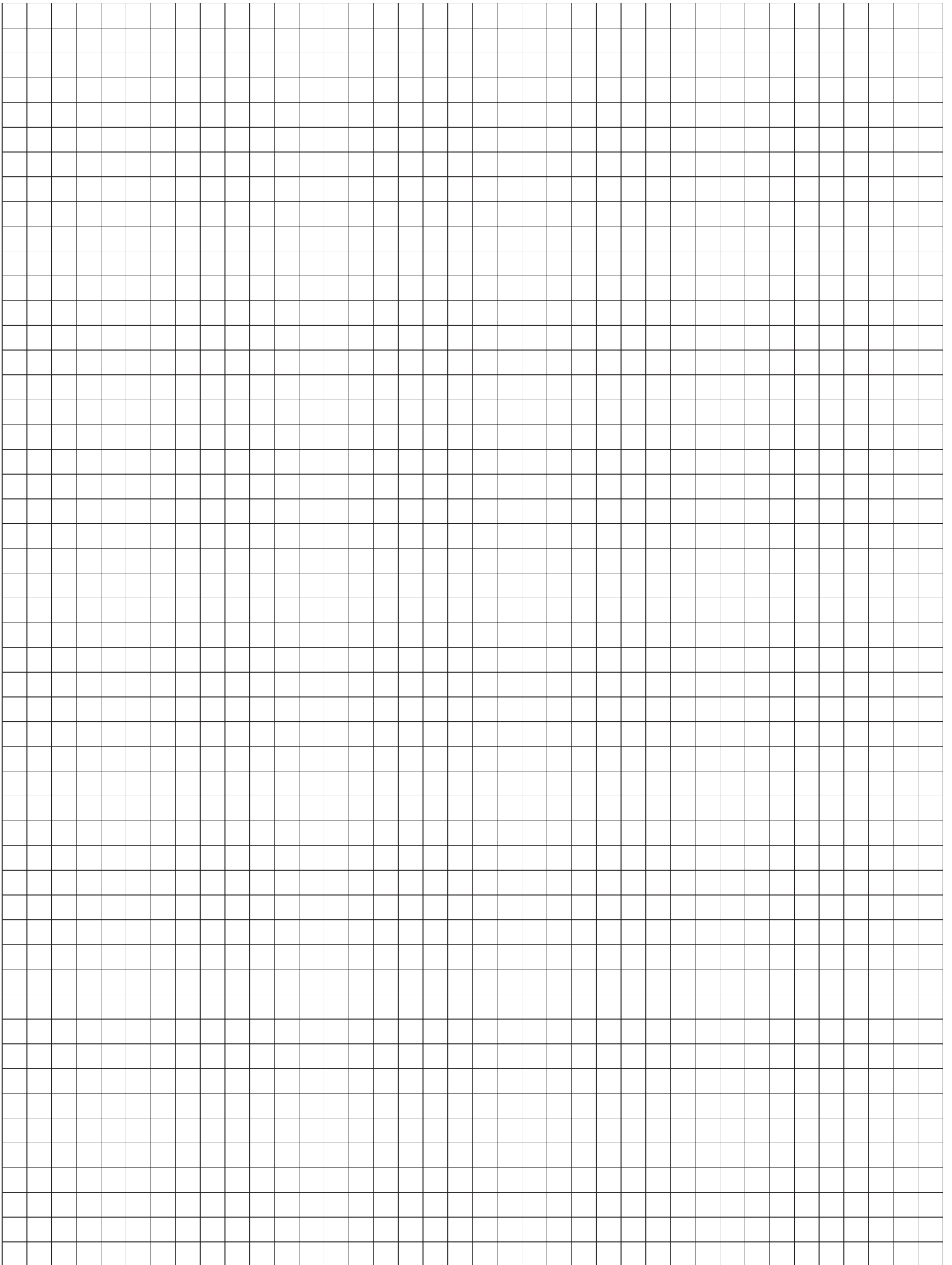
Pyramid or cone $V = \frac{1}{3}Bh$

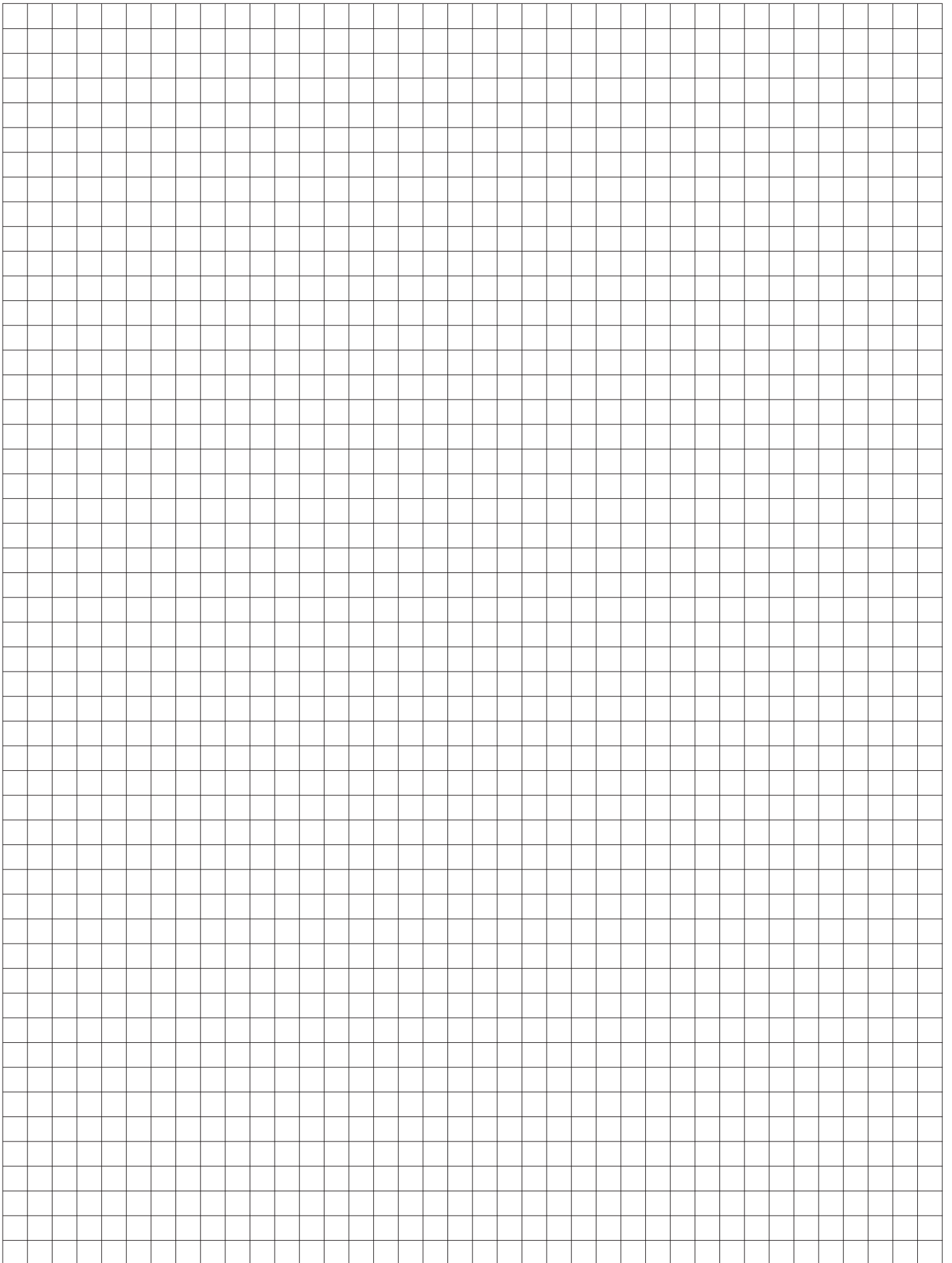
Sphere $V = \frac{4}{3}\pi r^3$

ADDITIONAL INFORMATION

Pi $\pi \approx 3.14$ or $\pi \approx \frac{22}{7}$

Pythagorean theorem $a^2 + b^2 = c^2$





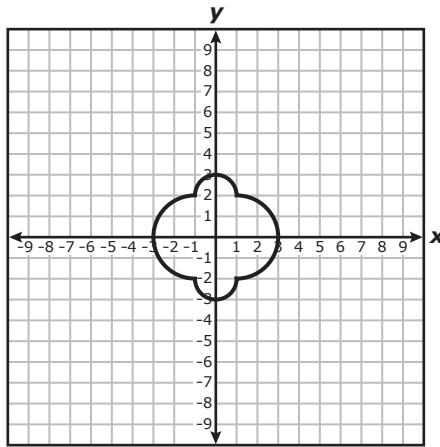
MATHEMATICS

DIRECTIONS

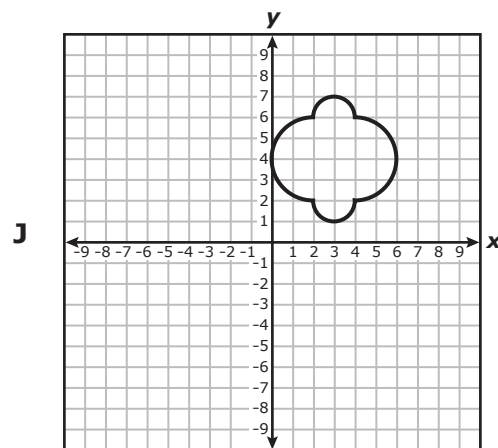
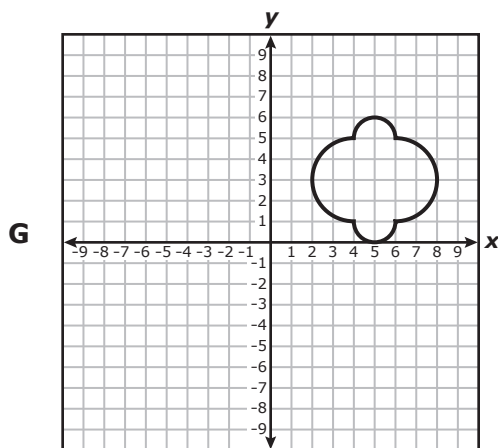
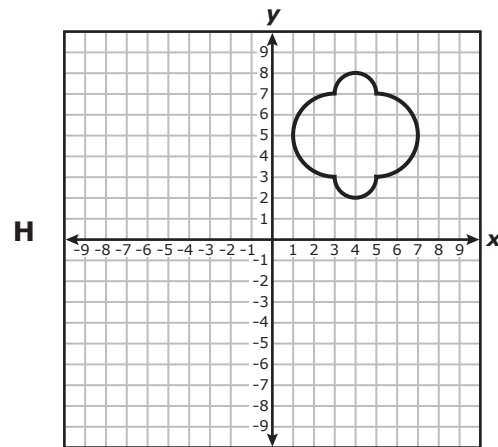
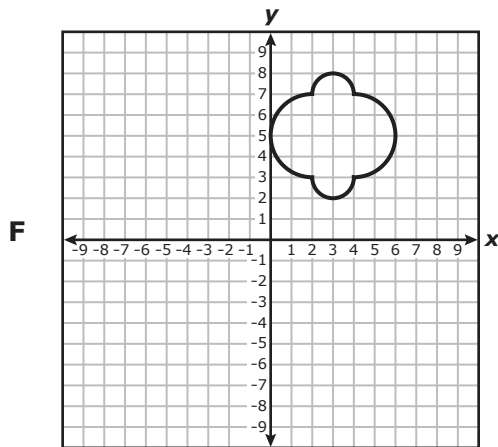
Read each question carefully. For a multiple-choice question, determine the best answer to the question from the four answer choices provided. For a griddable question, determine the best answer to the question. Then fill in the answer on your answer document.

- 1 Claudia is making a gelatin dessert for a party. She plans on making 12 servings for every 5 people. If each pan Claudia uses to make the dessert holds 8 servings, what is the minimum number of these pans that she needs in order to make enough to feed 10 people?
- A 4
 - B 2
 - C 3
 - D 5

2 A figure is shown on the grid below.



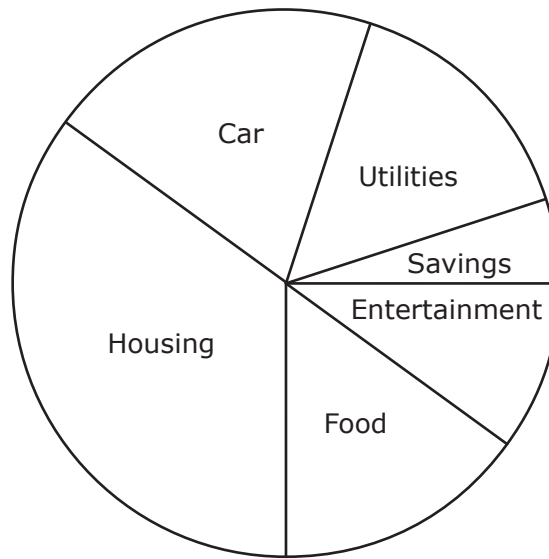
Which graph best represents this figure after it has been translated 5 units up and 3 units to the right?



- 3** A scientist had a bottle that contained 56.6 mL of a solution. She used 3.2 mL of the solution for an experiment. Then she poured half the solution remaining in the bottle into a beaker. Finally she poured 6 mL of the solution remaining in the bottle into a test tube. How many milliliters of solution remained in the bottle?
- A** 23.7 mL
 - B** 21.5 mL
 - C** 19.1 mL
 - D** 20.7 mL

- 4 Krista set up a monthly budget, as represented by the circle graph below.

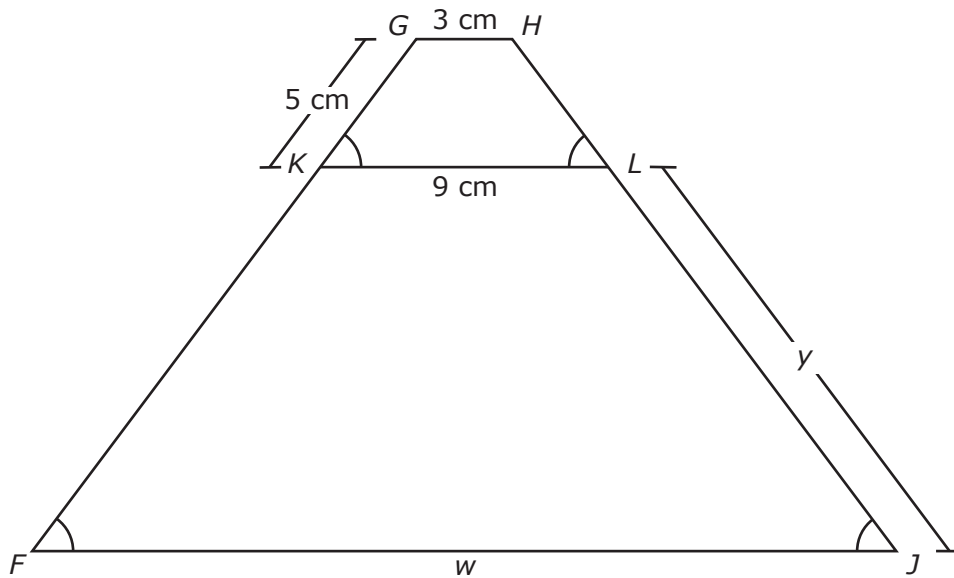
Krista's Monthly Budget



Which conclusion is NOT supported by the circle graph?

- F** Krista spends 50% of her income on housing and food.
- G** Krista spends 25% of her income on her car and utilities.
- H** Krista spends 50% of her income on housing and utilities.
- J** Krista spends 25% of her income on food and entertainment.

- 5 Janelle drew \overline{KL} in isosceles trapezoid $FGHJ$ to create similar trapezoids $FKLJ$ and $KGHL$.



Based on the given information, what are the values of y and w in centimeters?

- A $y = 11$ cm and $w = 15$ cm
- B $y = 15$ cm and $w = 15$ cm
- C $y = 11$ cm and $w = 27$ cm
- D $y = 15$ cm and $w = 27$ cm

6 A desk drawer contains the different-colored markers listed below.

- 3 green markers
- 5 blue markers
- 10 red markers

A marker will be randomly selected from the drawer and then replaced. Then another marker will be randomly selected from the drawer. What is the probability that a green marker will be selected both times?

F $\frac{1}{36}$

G $\frac{1}{6}$

H $\frac{1}{51}$

J $\frac{1}{54}$

7 An electrician charges \$75 for the first hour of labor and \$60 for each additional hour of labor. A customer calculates that the electrician charges \$225 for a total of $3\frac{1}{2}$ hours of labor. Is the customer correct?

- A Yes, because $(75 \times 3.5) - 60 = 225$
- B No, because $60 + (75 \times 3.5) = 322.50$
- C Yes, because $75 + (60 \times 2.5) = 225$
- D No, because $(75 \times 2.5) - 60 = 127.50$

8 A school counselor surveyed 90 randomly selected students about the languages they speak. Of the students surveyed, 16 speak more than one language fluently. Based on these results, how many of the 1,800 students at the school can be expected to speak more than one language fluently?

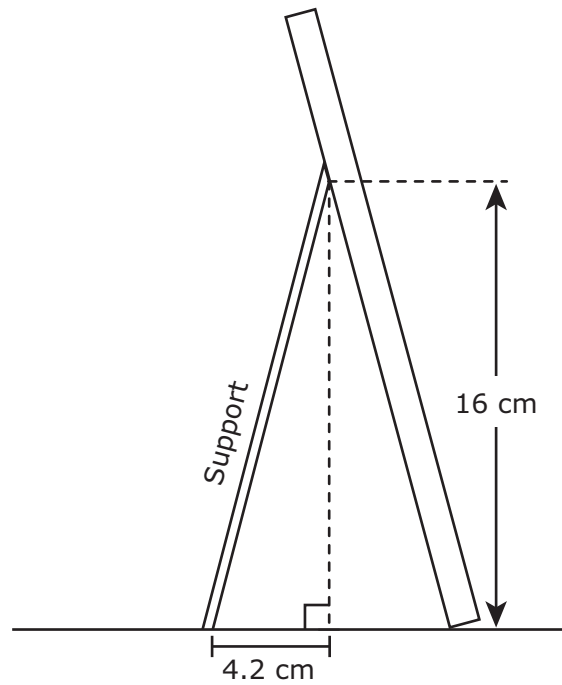
F 113

G 288

H 389

J 320

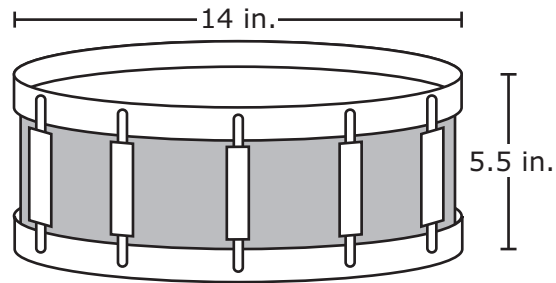
- 9 The drawing below shows a side view of a picture frame on Mary's desk.



Which of the following is closest to the length of the frame support?

- A 20 cm
- B 15 cm
- C 12 cm
- D 17 cm

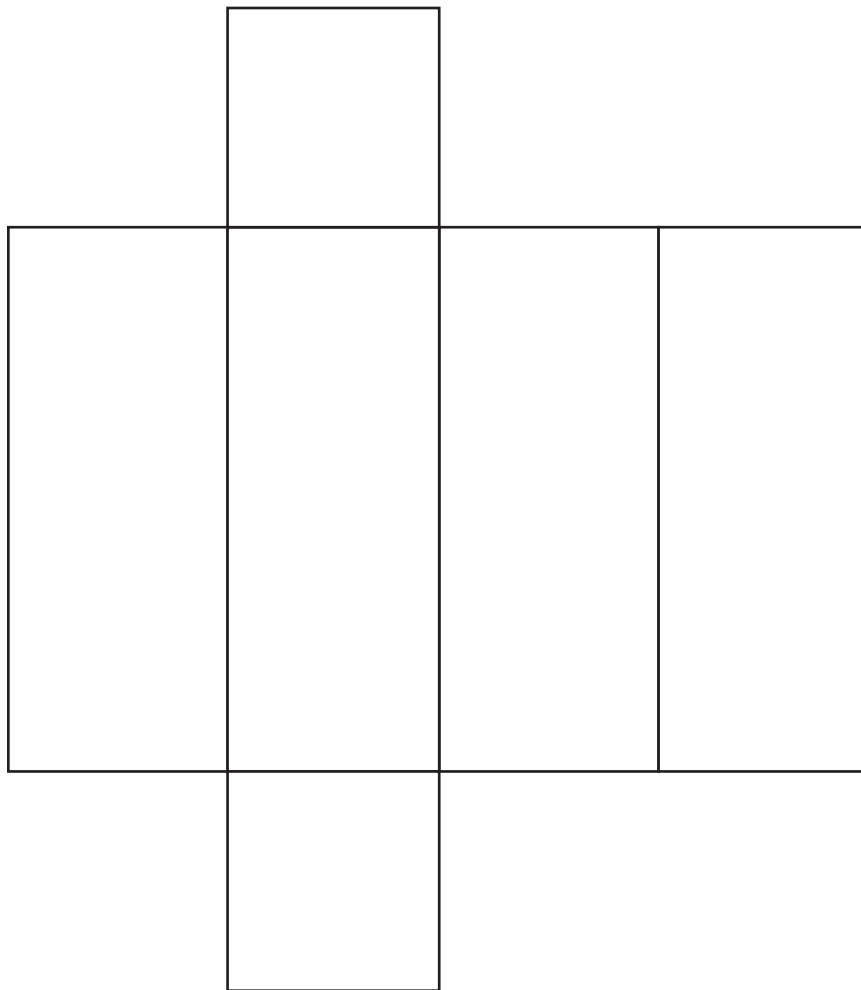
- 10** Regina owns a drum that has a diameter of 14 inches and a height of 5.5 inches, as shown below. She wants to design a new drum by dilating the dimensions of the original drum by a scale factor of 1.4.



What will be the diameter, d , and the height, h , of the new drum?

- F** $d = 19.6$ in. and $h = 7.7$ in.
- G** $d = 15.4$ in. and $h = 6.9$ in.
- H** $d = 12.5$ in. and $h = 4$ in.
- J** $d = 22.5$ in. and $h = 14$ in.

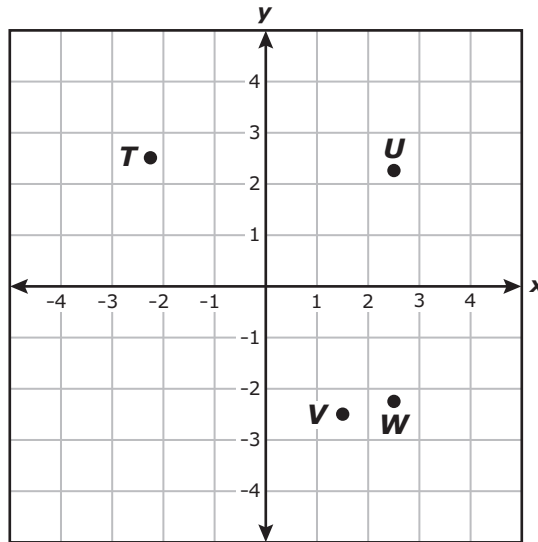
- 11** The net of a rectangular prism is shown below. Use the ruler provided to measure the dimensions of the net to the nearest tenth of a centimeter.



Which of the following is closest to the total surface area of this prism?

- A** 80.6 cm^2
- B** 98.3 cm^2
- C** 122.4 cm^2
- D** 88.8 cm^2

- 12 There are four points graphed on the grid below.



Which point on the grid appears to be located at $(\frac{5}{2}, -\frac{9}{4})$?

- F Point *T*
 - G Point *U*
 - H Point *V*
 - J Point *W*
-
- 13 A can of juice contains 175 calories per 2.5 servings. Which of the following is NOT an equivalent number of calories per serving?
- A 280 calories per 4 servings
 - B 910 calories per 13 servings
 - C 525 calories per 8 servings
 - D 630 calories per 9 servings

- 14** A paper drinking cup in the shape of a cone has a height of 10 centimeters and a diameter of 8 centimeters. Which of the following is closest to the volume of the cup in cubic centimeters?
- F** 167 cm³
 - G** 209 cm³
 - H** 670 cm³
 - J** 502 cm³

-
- 15** Anita has a collection of postage stamps from different countries. She has one book that contains 35 stamps. She has a second book that has 7 stamps on each page. The equation below can be used to find t , the total number of postage stamps Anita has if the second book has p pages.

$$t = 35 + 7p$$

How many postage stamps does Anita have in all if the second book has 14 pages?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

- 16** Seth uses a school camera to take pictures for the yearbook and for the school paper. Last month he took 270 pictures for the yearbook and 180 pictures for the school paper with this camera. Which proportion can be used to determine p , the percentage of the total number of pictures he took that were for the yearbook?

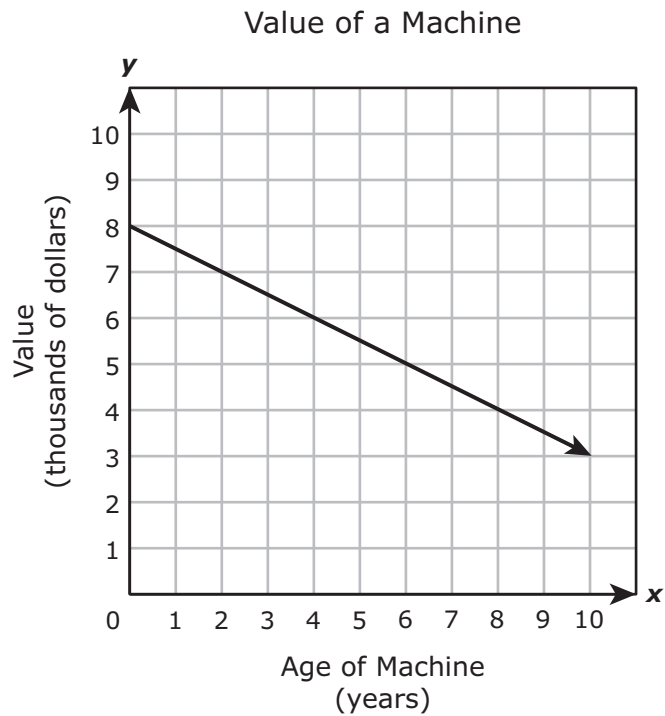
F $\frac{p}{100} = \frac{270}{450}$

G $\frac{p}{100} = \frac{180}{450}$

H $\frac{p}{100} = \frac{450}{270}$

J $\frac{p}{100} = \frac{270}{180}$

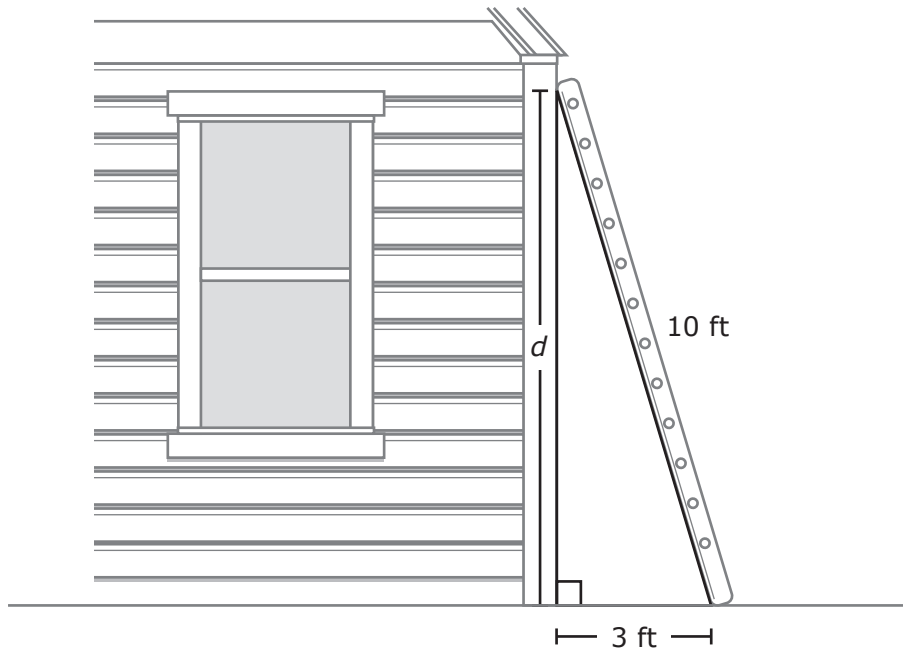
- 17 The graph models the value of a machine over a 10-year period.



Which equation best represents the relationship between x , the age of the machine in years, and y , the value of the machine in dollars over this 10-year period?

- A $y = -0.002x + 2,500$
- B $y = -500x + 8,000$
- C $y = 500x + 8,000$
- D $y = 0.002x + 2,500$

- 18 Gwendolyn placed a 10-foot ladder against the side of her house so that the base of the ladder was 3 feet from the base of the house, as shown in the diagram below.



Which measurement in feet is closest to d , the distance from the top of the ladder to the ground?

- F 10.4 ft
- G 7.0 ft
- H 6.5 ft
- J 9.5 ft

19 During one month, four trees at a nursery increased in height at the rates shown below.

$$8\%, \frac{1}{12}, 16\%, \frac{1}{20}$$

Which list shows these rates in order from greatest to least?

A $\frac{1}{20}, 16\%, \frac{1}{12}, 8\%$

B $16\%, \frac{1}{12}, 8\%, \frac{1}{20}$

C $\frac{1}{20}, 8\%, \frac{1}{12}, 16\%$

D $16\%, 8\%, \frac{1}{12}, \frac{1}{20}$

- 20 The table below shows the cost of mailing packages that weigh different amounts.

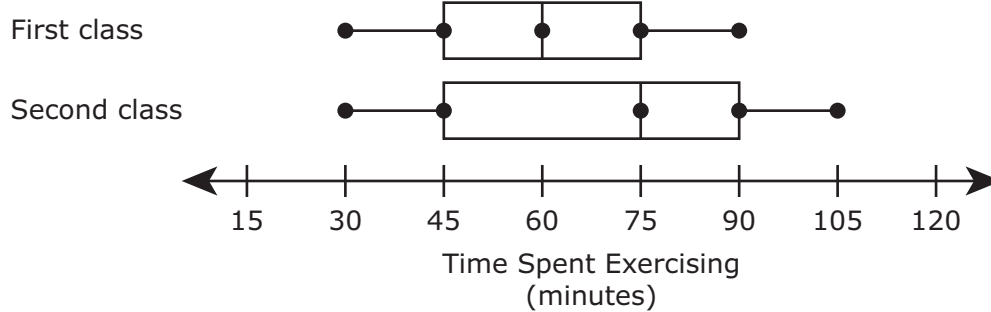
Cost of Mailing Packages

Package Weight (ounces)	Cost
Up to 1.00	\$1.17
1.01 to 2.00	\$1.34
2.01 to 3.00	\$1.51
3.01 to 4.00	\$1.68
4.01 to 5.00	\$1.85

If the cost continues to increase as shown in the table, how much will it cost to mail a package that weighs exactly 11 ounces?

- F \$2.87
- G \$4.87
- H \$3.04
- J \$5.87

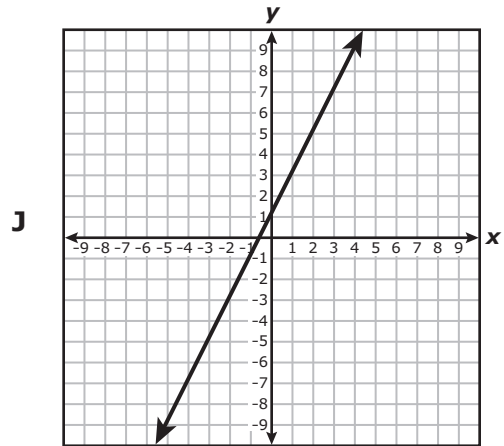
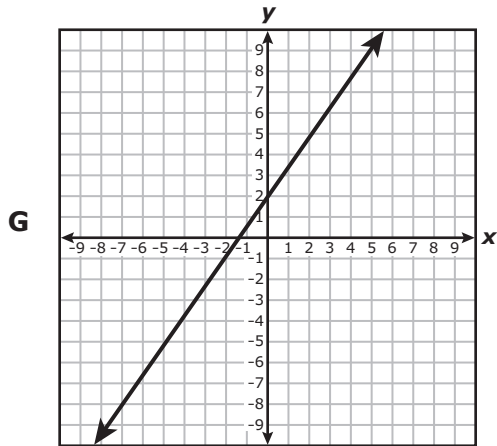
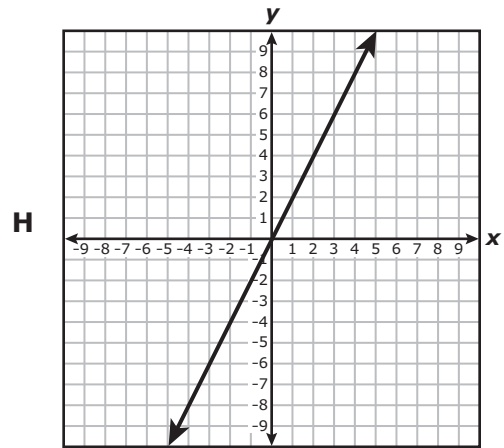
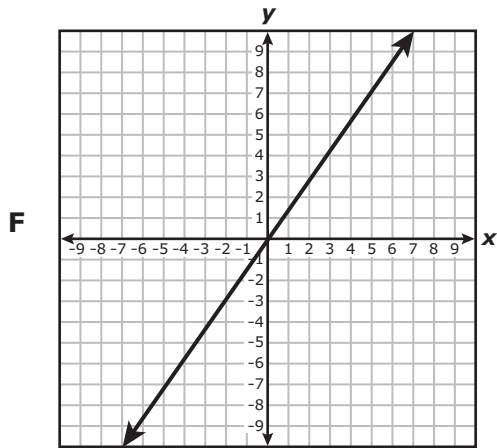
- 21** The number of students in each of 2 exercise classes was the same. The box and whisker plots below represent the average amount of time the students in each class spent exercising daily outside class.



Based on the information in the box and whisker plots, which statement about the time spent exercising outside class appears to be true?

- A** The median amount of time the first class spent exercising was greater than the median amount of time the second class spent exercising.
- B** The range for the second class was less than the range for the first class.
- C** The interquartile range for the first class was less than the interquartile range for the second class.
- D** The minimum amount of time the second class spent exercising was greater than the minimum amount of time the first class spent exercising.

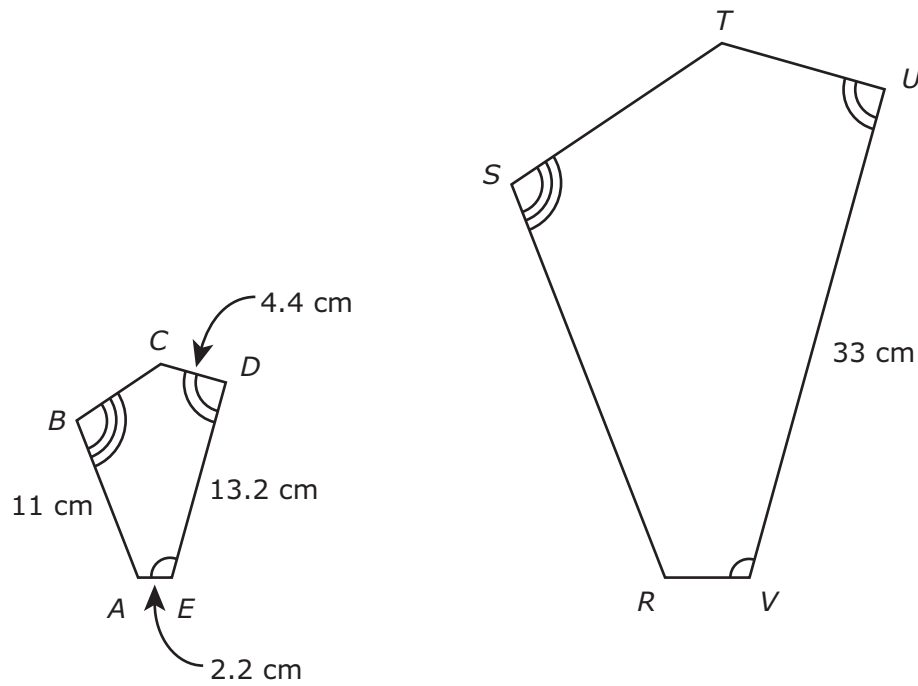
22 Which graph best represents the equation $y = 1.4x + 2$?



- 23** The roof of a house is in the shape of a square pyramid. The slant height of the pyramid is 17 feet, and the length of each side of the square is 30 feet. What is the lateral surface area of the pyramid in square feet?
- A** 1,920 ft²
 - B** 2,040 ft²
 - C** 1,020 ft²
 - D** 1,410 ft²

-
- 24** Carlos has a square tablecloth with a total area of 48 square feet. Which measurement is closest to the length of each side of the tablecloth in feet?
- F** 9.8 ft
 - G** 5.0 ft
 - H** 12.0 ft
 - J** 6.9 ft

- 25 Pentagon $ABCDE$ is similar to pentagon $RSTUV$. The perimeter of pentagon $ABCDE$ is 36.8 centimeters.



What is the length of \overline{ST} ?

- A 18 cm
- B 25.8 cm
- C 15 cm
- D 19.8 cm

26 The numbers below form an arithmetic sequence.

$$-4, -7, -10, -13, -16, \dots$$

Which expression can be used to find the n th term in the sequence?

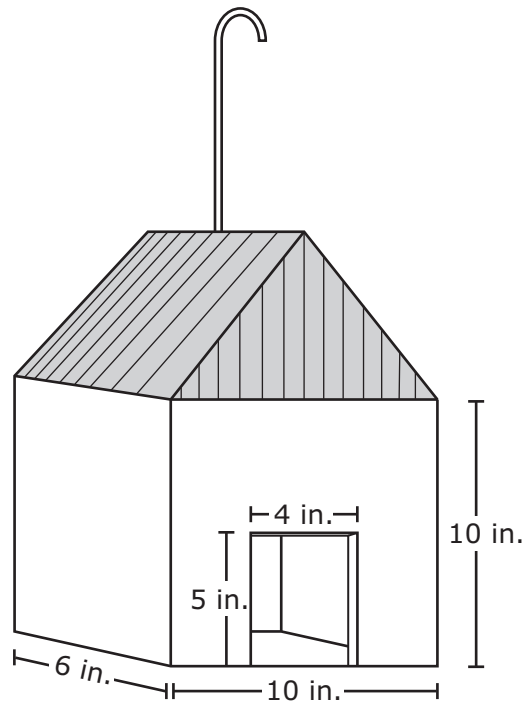
F $-3n - 1$

G $3n - 4$

H $-3n + 4$

J $3n + 1$

- 27 Sakura has a birdhouse with rectangular walls, a rectangular bottom, and a rectangular entry, like the one modeled below.



She will paint the four outside walls but not the bottom or the roof of the birdhouse. What is the area that Sakura will paint?

- A 320 in.²
- B 160 in.²
- C 300 in.²
- D 140 in.²

- 28** A bag of fruit contains 3 apples, 2 oranges, 1 banana, and 4 pears. Gerald will randomly select two pieces of fruit one at a time from the bag and not put them back. What is the probability that the first piece of fruit Gerald selects will be a banana and the second piece of fruit will be a pear?

F $\frac{1}{25}$

G $\frac{2}{45}$

H $\frac{1}{2}$

J $\frac{4}{9}$

-
- 29** Jake has two summer jobs. The table below shows how many hours he worked at the two jobs last week and his total earnings from each.

Hours Jake Worked and His Earnings

Job	Hours Worked Last Week	Total Amount Earned Last Week
Cashier	9	\$81.00
Grocery stocker	12	\$129.00

This week Jake is scheduled to work 11 hours as a cashier and 17 hours as a grocery stocker. Based on the information in the table, what will be the total amount he earns from the two jobs if he works all the scheduled hours this week?

- A** \$281.75
B \$252.00
C \$271.25
D \$280.00

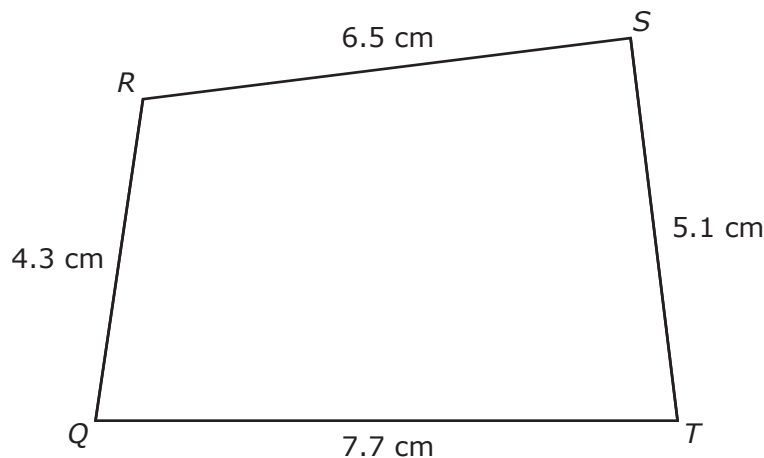
30 Roland sold candy bars for a school fund-raiser during three weeks. Some information about Roland's candy-bar sales is provided below.

- Roland sold 26 candy bars during the first week.
- The number of candy bars he sold during the second week was 4 less than 2 times the number of candy bars he sold during the first week.
- The number of candy bars he sold during the third week was 6 more than $1\frac{1}{2}$ times the number of candy bars he sold during the second week.

What was the total number of candy bars Roland sold during the three weeks?

- F** 145
- G** 152
- H** 155
- J** 142

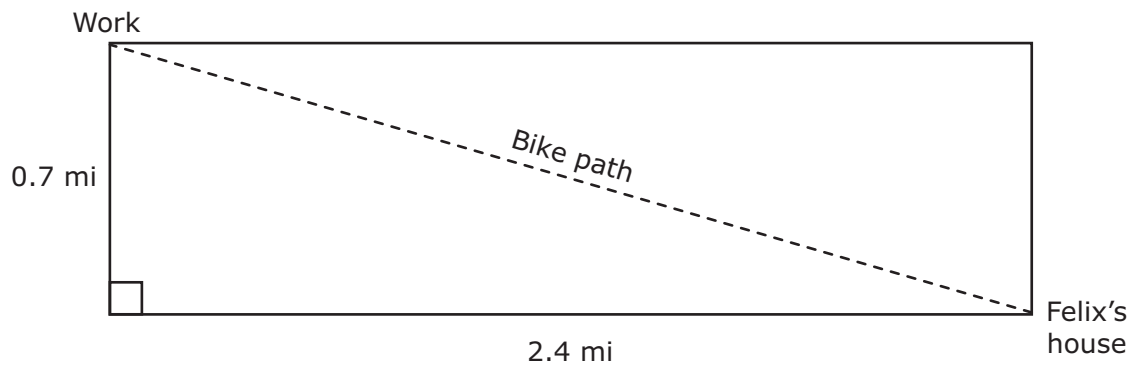
31 Polygon $QRST$ below was dilated by a scale factor of $\frac{9}{5}$ to create polygon $Q'R'S'T'$.



What is the length in centimeters of $\overline{R'S'}$?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

- 32** To get from home to work, Felix can either take a bike path through the rectangular park or ride his bike along two sides of the park.

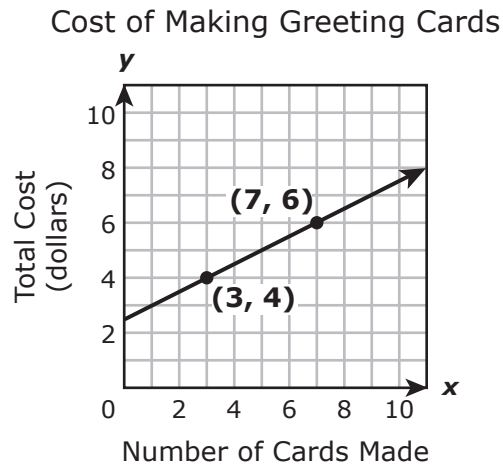


How much farther would Felix travel by riding along two sides of the park than he would by taking the path through the park?

- F** 1.7 mi
 - G** 0.6 mi
 - H** 2.5 mi
 - J** 0.1 mi
-
- 33** A baseball coach bought some bats and gloves for the school's baseball team. The bats cost \$20 to \$35, and the gloves cost \$30 to \$60. Which of these does NOT represent a reasonable total purchase price for 15 bats and 12 gloves?

- A** \$1,350
- B** \$890
- C** \$1,200
- D** \$705

- 34** Sal purchased some art supplies and card stock in order to make greeting cards. The graph below shows the relationship between the number of cards Sal makes and the total cost of the materials used to make the cards.



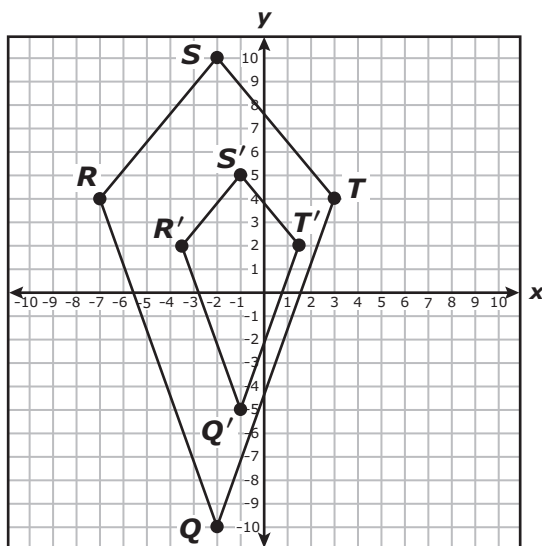
Based on the graph, what will be the total cost of making 25 greeting cards?

- F** \$12.50
- G** \$50.00
- H** \$52.50
- J** \$15.00

- 35** The director of a middle school play wants to find out how many students at the school plan to see the play on opening night. Which sampling method is most likely to provide valid results?
- A** Surveying 2 randomly chosen students from each of the 25 homeroom classes at the school
 - B** Surveying 50 randomly chosen students in eighth grade
 - C** Surveying 5 randomly chosen students from each of the 10 art classes at the school
 - D** Surveying 10 randomly chosen students reading in the library during 5 different lunch periods

-
- 36** A community center is collecting blankets. The director of the center has asked 135 families to donate 3 blankets each. If 20% to 40% of the families donate 3 blankets each, which of these could be the number of blankets the center collects from these families?
- F** 240
 - G** 50
 - H** 110
 - J** 170

- 37 Quadrilateral $Q'R'S'T'$ is a dilation of quadrilateral $QRST$, with the origin as the center of dilation.



What appears to be the scale factor used to create this dilation?

- A 4
- B 0.5
- C 2
- D 0.25

38 A ball shaped like a sphere has a radius of approximately $2\frac{1}{8}$ inches. Which of the following is the best estimate of the volume of the ball?

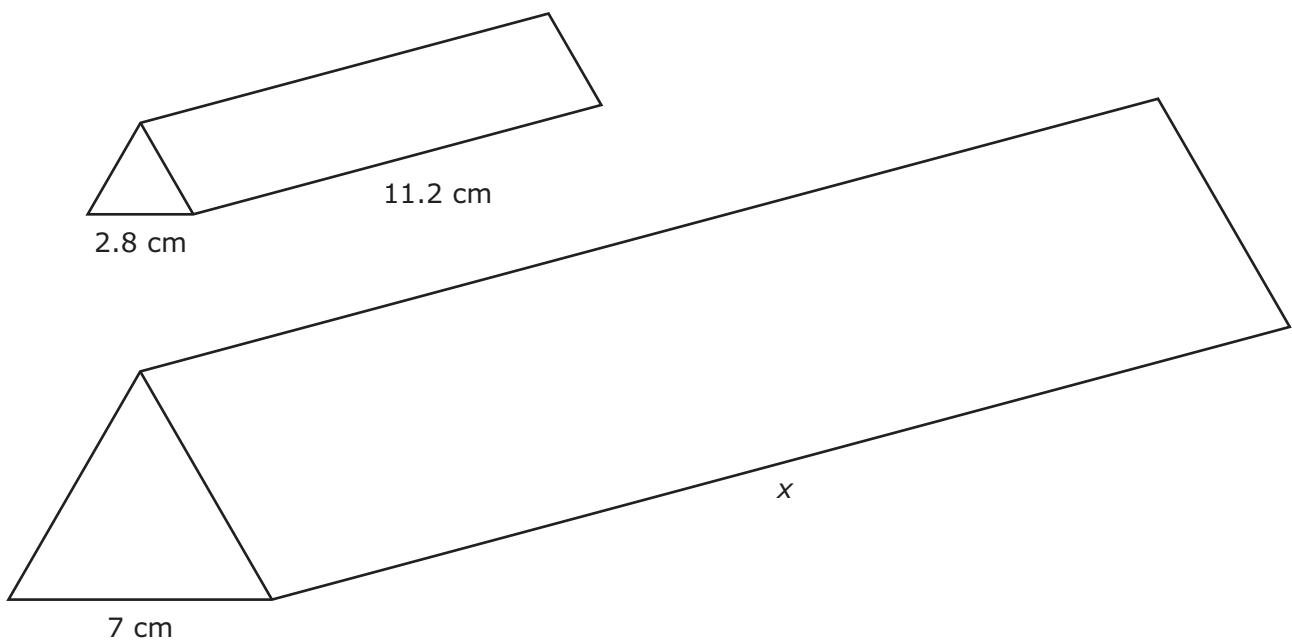
F 32 in.³

G 11 in.³

H 25 in.³

J 17 in.³

39 The bases of the two similar triangular prisms shown below are equilateral triangles.



What is the value of x , an edge length of the larger prism in centimeters?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

- 40** As part of a survey, 50 students were asked about their favorite lunch item. The results are shown in the table below.

Lunch Preferences

Favorite Item	Number of Students
Pizza	10
Tacos	5
Hot dogs	15
Hamburgers	20

The cafeteria manager knows that about 300 students buy lunch from the cafeteria each day. Based on the table, she predicts that 60 students will buy pizza each day. Which statement about her prediction is true?

- F** Her prediction is invalid because $\frac{1}{5}$ of 50 is 10.
- G** Her prediction is invalid because $\frac{1}{4}$ of 300 is 75.
- H** Her prediction is valid because 120% of 50 is 60.
- J** Her prediction is valid because 20% of 300 is 60.

41 A cube is dilated by a scale factor of $\frac{3}{4}$ to create a new cube. The surface area of the new cube is —

A $\frac{3}{2}$ the surface area of the original cube

B $\frac{27}{64}$ the surface area of the original cube

C $\frac{9}{16}$ the surface area of the original cube

D $\frac{9}{4}$ the surface area of the original cube

42 The money in Juan's savings account earns $1\frac{1}{4}\%$ interest. Which value is less than $1\frac{1}{4}\%$?

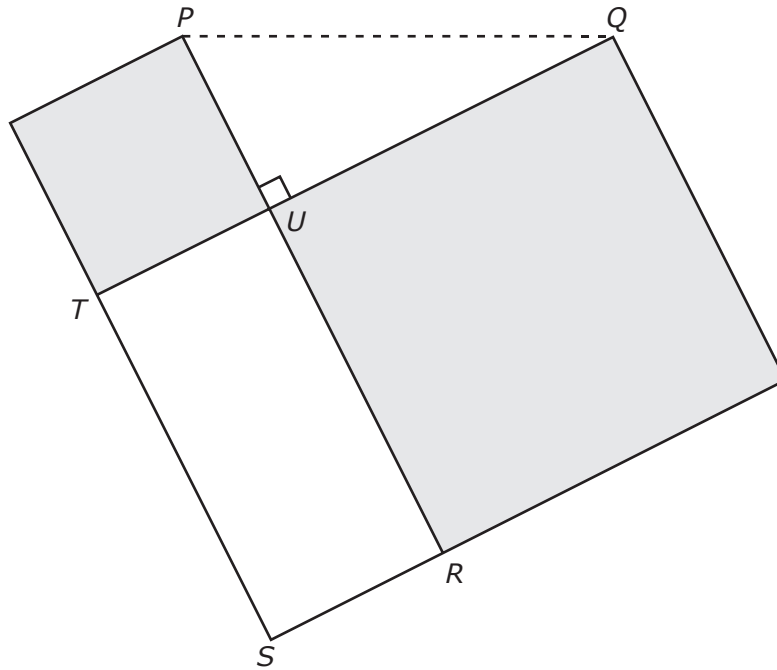
F $\frac{5}{4}$

G 0.125

H $\frac{1}{80}$

J 0.0114

43 In the diagram below, $RSTU$ is a rectangle, and the two shaded regions are squares.



If the length of \overline{SR} is 4 m and the length of \overline{ST} is 8 m, what is the length of \overline{PQ} in meters?

- A $\sqrt{80}$ m
- B $\sqrt{24}$ m
- C $\sqrt{68}$ m
- D $\sqrt{144}$ m

- 44** Leonard had t tickets for the rides at a county fair. He kept 9 of the tickets and gave an equal number of the remaining tickets to 6 of his friends. There were no tickets left over. Which equation can be used to find f , the number of tickets Leonard gave to each of his friends?

F $f = \frac{t}{6} + 9$

G $f = \frac{t + 9}{6}$

H $f = \frac{t}{6} - 9$

J $f = \frac{t - 9}{6}$

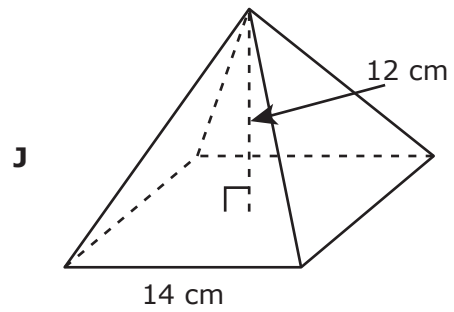
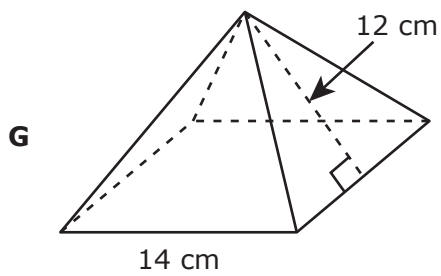
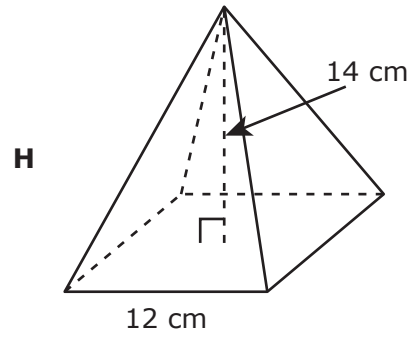
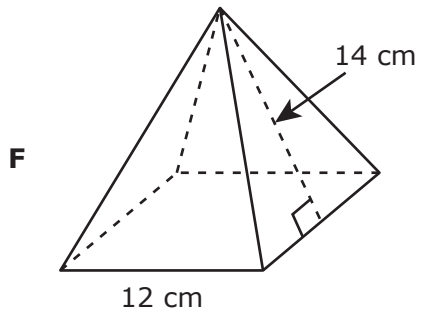
-
- 45** One weekend Greg and Darius shoveled snow to earn spending money. Together they earned \$12.50 an hour for 9 hours of work. Each received half the total earnings. If Greg then spent \$15 on a new CD, what was the total amount he had left, in dollars and cents, from the money he earned shoveling snow that weekend?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

- 46 Trent used the expression below to find the volume, in cubic centimeters, of a square pyramid.

$$\frac{1}{3}(12^2)(14)$$

Which square pyramid has a volume equal to the value of the expression Trent wrote?



- 47** Dominic used the equation below to find d , the amount in dollars he would spend on gasoline to drive a distance of m miles.

$$d = \frac{m}{25}(3.5)$$

Based on this equation, how much would Dominic spend on gasoline to drive a distance of 180 miles?

- A** \$25.20
- B** \$21.00
- C** \$24.50
- D** \$28.00

-
- 48** Abdul is 5 feet tall. Which equation can be used to determine h , Abdul's height in centimeters, if 1 inch is equal to 2.54 centimeters?

F $h = 2.54(5)$

G $h = \frac{1}{2.54}(5)(12)$

H $h = 2.54(5)(12)$

J $h = \frac{1}{2.54}(5)$

49 Jessica skated 4 laps in 82 seconds. Which of the following is an equivalent rate of skating?

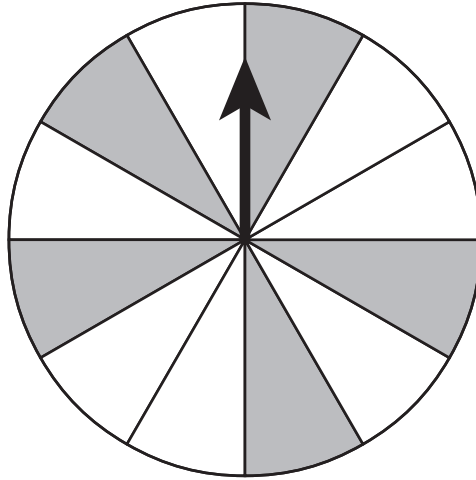
- A** 6 laps in 120 seconds
- B** 10 laps in 205 seconds
- C** 6 laps in 130 seconds
- D** 10 laps in 215 seconds

50 Which list shows the numbers below in order from least to greatest?

$$-6\frac{1}{2}, 7.25, \frac{46}{7}, 6\frac{1}{4}, -5.58, \frac{84}{9}$$

- F** $-6\frac{1}{2}, -5.58, 6\frac{1}{4}, \frac{46}{7}, 7.25, \frac{84}{9}$
- G** $-5.58, 6\frac{1}{4}, \frac{46}{7}, -6\frac{1}{2}, \frac{84}{9}, 7.25$
- H** $-6\frac{1}{2}, 6\frac{1}{4}, -5.58, \frac{46}{7}, 7.25, \frac{84}{9}$
- J** $-5.58, -6\frac{1}{2}, 6\frac{1}{4}, \frac{46}{7}, 7.25, \frac{84}{9}$

51 The spinner below has 12 congruent sections.



Sarah will spin the arrow on the spinner twice. What is the probability that the arrow will land on a shaded section of the spinner on both spins?

A $\frac{25}{144}$

B $\frac{1}{9}$

C $\frac{5}{33}$

D $\frac{25}{49}$

- 52 John is having a new deck built. He paid \$485 for the required materials, and he will pay his brother \$25 an hour to build the deck. Which table shows the relationship between h , the number of hours John's brother works, and c , the total cost of the project?

F

h	c
0	485
3	510
8	535
12	560

H

h	c
0	485
3	560
8	685
12	785

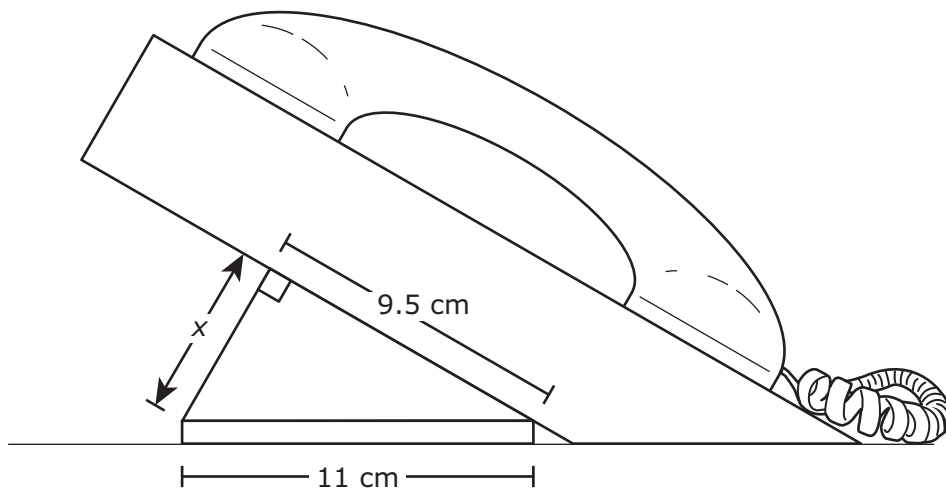
G

h	c
0	510
3	535
8	560
12	585

J

h	c
0	510
3	585
8	710
12	810

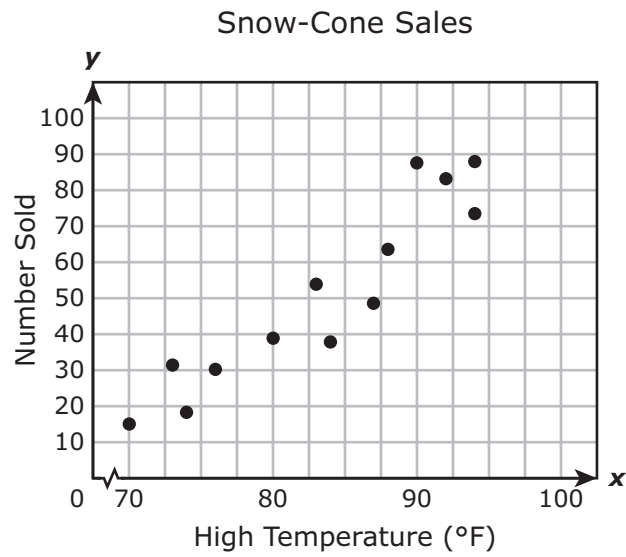
53 A side view of a desk telephone is shown below.



Which of the following is closest to the value of x ?

- A 2 cm
- B 10 cm
- C 20 cm
- D 6 cm

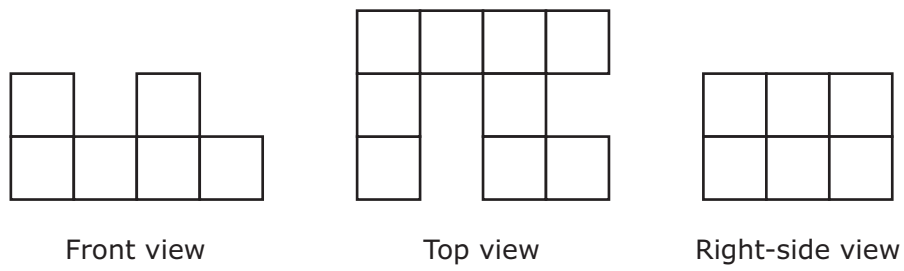
- 54 The scatterplot below shows the relationship between the daily high temperature and the number of snow cones sold at a concession stand on that day.



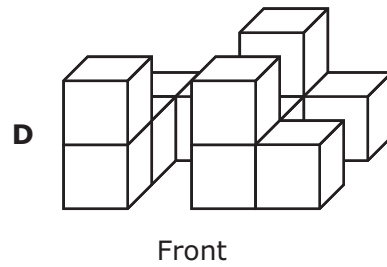
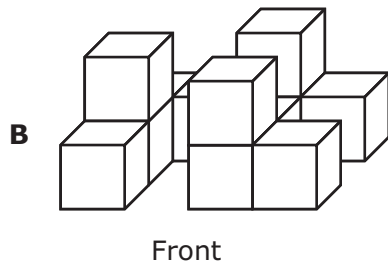
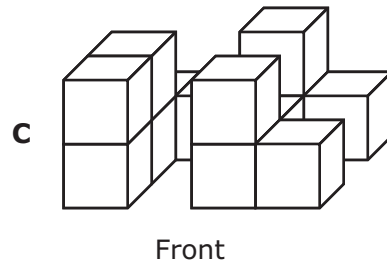
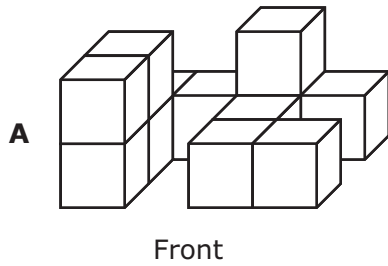
Based on the scatterplot, approximately how many snow cones will be sold on a day when the high temperature is 82°F?

- F 63
- G 46
- H 29
- J 33

55 The drawing below shows the front, top, and right-side views of a three-dimensional figure made of identical cubes.



Which figure is NOT represented by these views?

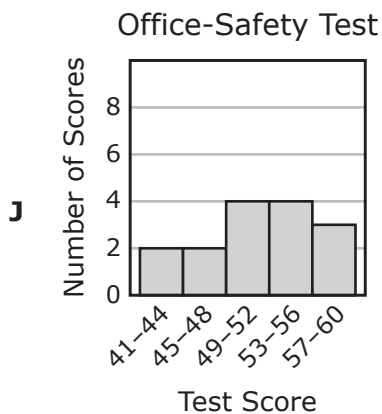


- 56** Each of the 20 employees in an office took a 60-point test on office safety. The test scores are listed in the table below.

Scores on Office-Safety Test

41	50	53	56
44	51	53	57
47	52	54	58
48	52	55	58
49	52	56	60

Which histogram best represents the data in the table?



BE SURE YOU HAVE RECORDED ALL OF YOUR ANSWERS
ON THE ANSWER DOCUMENT.



**STAAR
GRADE 8
Mathematics
April 2014**