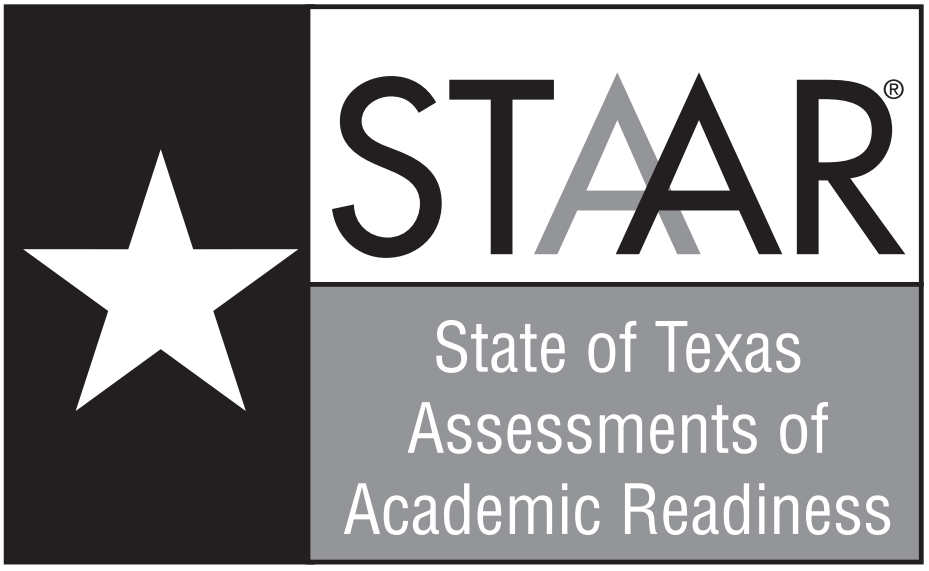


GRADE 8

Mathematics

Administered April 2013

RELEASED

Copyright © 2013, Texas Education Agency. All rights reserved. Reproduction of all or portions of this work is prohibited without express written permission from the Texas Education Agency.

STAAR GRADE 8 MATHEMATICS REFERENCE MATERIALS

LENGTH

Customary	Metric
1 mile (mi) = 1,760 yards (yd)	1 kilometer (km) = 1,000 meters (m)
1 yard (yd) = 3 feet (ft)	1 meter (m) = 100 centimeters (cm)
1 foot (ft) = 12 inches (in.)	1 centimeter (cm) = 10 millimeters (mm)

VOLUME AND CAPACITY

Customary	Metric
1 gallon (gal) = 4 quarts (qt)	1 liter (L) = 1,000 milliliters (mL)
1 quart (qt) = 2 pints (pt)	
1 pint (pt) = 2 cups (c)	
1 cup (c) = 8 fluid ounces (fl oz)	

WEIGHT AND MASS

Customary	Metric
1 ton (T) = 2,000 pounds (lb)	1 kilogram (kg) = 1,000 grams (g)
1 pound (lb) = 16 ounces (oz)	1 gram (g) = 1,000 milligrams (mg)

TIME

1 year = 12 months

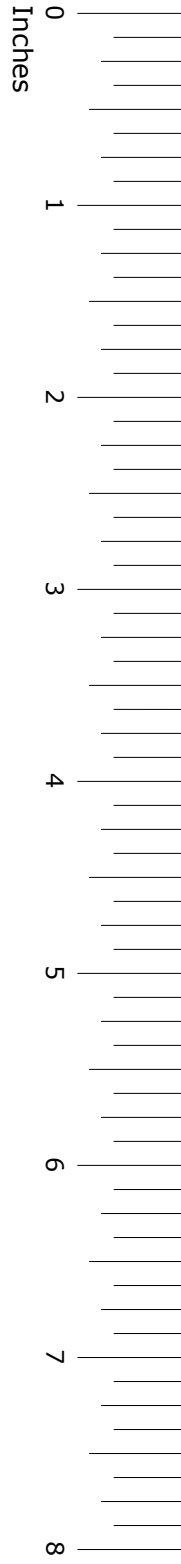
1 year = 52 weeks

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

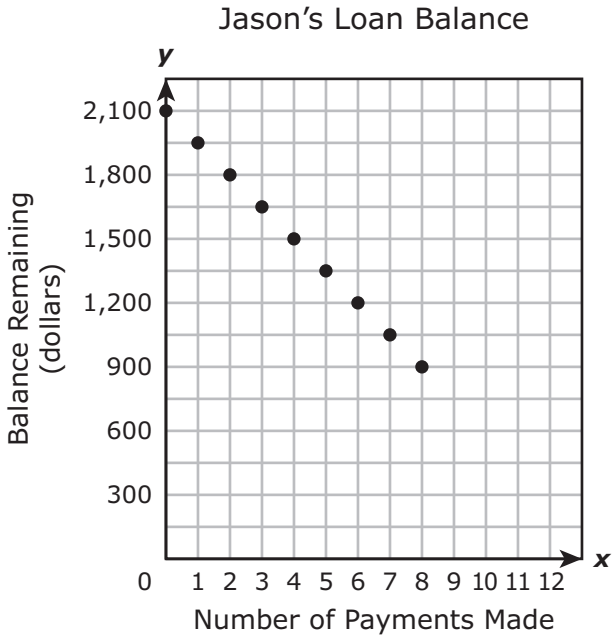
Pi	$\pi \approx 3.14$	or	$\pi \approx \frac{22}{7}$
Pythagorean theorem			$a^2 + b^2 = c^2$

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 The graph below shows the balance remaining on Jason's loan after he makes each payment.



Based on this graph, what will be the balance remaining on Jason's loan after he makes the 12th payment?

A $750

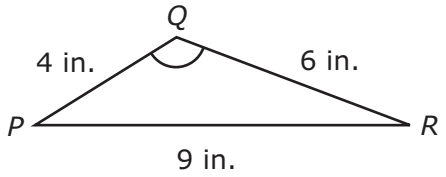
B $150

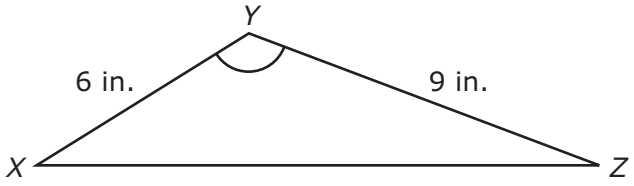
C $450

D $300

GO ON

2 Triangle *PQR* is similar to triangle *XYZ*.





What is the length of $\overline{XZ}$?

F 11 in.

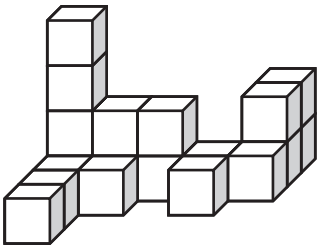
G 13.5 in.

H 9 in.

J 20.25 in.

GO ON

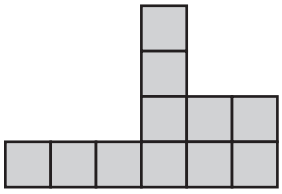
3 A three-dimensional figure made of identical cubes is shown below.



Front

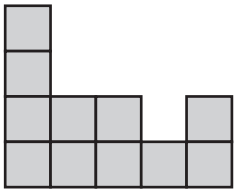
Which of these could be the right-side view of this figure?

A



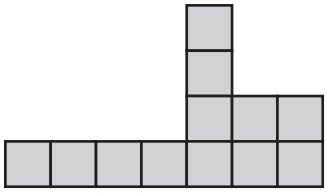
Right-side view

C



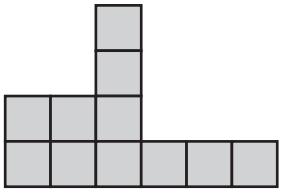
Right-side view

B



Right-side view

D



Right-side view

GO ON

4 To make 6 glasses of lemonade, Karla uses $\frac{1}{2}$ cup of sugar, $\frac{1}{2}$ cup of lemon juice, and $5\frac{1}{2}$ cups of water. If Karla wants to make 10 glasses of lemonade, which proportion can she use to determine how many cups of water, w, she will need?

F $\frac{6.5}{6} = \frac{10}{w}$

G $\frac{6}{6.5} = \frac{10}{w}$

H $\frac{10}{5.5} = \frac{6}{w}$

J $\frac{6}{5.5} = \frac{10}{w}$

---

5 The expression below describes an arithmetic sequence of numbers.

$$9 - 4n$$

If n represents the position of a term in the sequence, which of the following sequences of numbers could this expression describe?

A 4, 3, 2, 1, 0, . . .

B 5, 10, 15, 20, 25, . . .

C 5, 1, −3, −7, −11, . . .

D 13, 17, 21, 25, 29, . . .

GO ON

6 Boris has a coin and a number cube. The number cube is labeled 1 through 6. He flips the coin once and rolls the number cube once. What is the probability that the coin lands tails-up and the cube lands on an even number?

F $\frac{2}{3}$

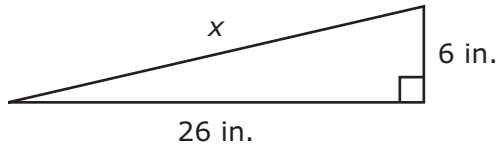
G $\frac{1}{4}$

H $\frac{1}{12}$

J $\frac{1}{6}$

GO ON

7 The diagram below represents the side view of a bike ramp.



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

A 27 in.

B 32 in.

C 25 in.

D 20 in.

GO ON

8 Which numbers from this list are less than -0.94?

$$-\frac{15}{16},\ 0.24,\ -2.23,\ 97\%,\ -2\frac{2}{5},\ -0.95$$

F $-\frac{15}{16}$, -2.23, and -0.95

G -2.23, $-2\frac{2}{5}$, and -0.95

H 0.24, $-\frac{15}{16}$, and -0.95

J $-\frac{15}{16}$, 0.24, and -2.23

---

9 A square has a side length of $5\frac{1}{2}$ inches. This square is dilated by a scale factor of $\frac{4}{5}$ to create a new square. What is the side length of the new square?

A $4\frac{4}{5}$ in.

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

C $4\frac{2}{5}$ in.

D Not here

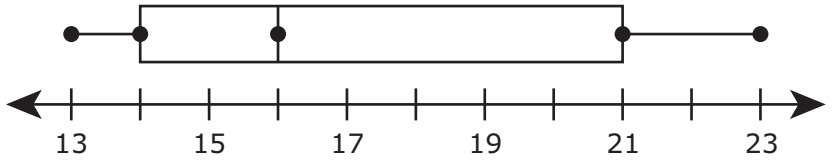
GO ON

10 The ages of the members of a volunteer group are shown below.

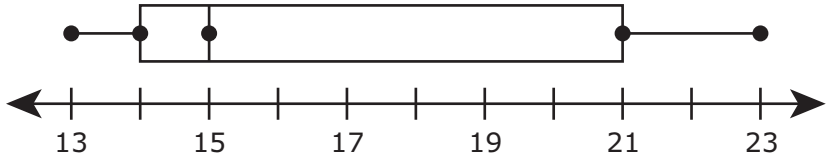
13, 14, 14, 14, 15, 15, 15, 16, 16, 21, 23

Which box and whisker plot best represents these data?

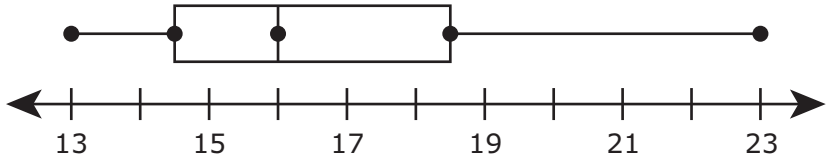
F



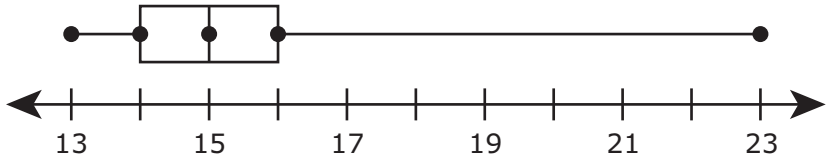
G



H



J



GO ON

11 Juanita covered the outside of a gift box shaped like a rectangular prism with paper. The box is 3.2 feet long, 2.1 feet wide, and 2.7 feet high. Which of the following is closest to the total surface area of this box?

A 34 ft^2

B 42 ft^2

C 30 ft^2

D 18 ft^2

---

12 Mr. Martínez has 3 ice chests. He is placing 14 lunches in each ice chest. Each lunch contains a sandwich, a bag of chips, and a drink. About 55% of these lunches contain a ham sandwich. Which of the following is closest to the number of lunches that contain a ham sandwich?

F 23

G 8

H 17

J 9

GO ON

13 A librarian recorded the number of books that were checked out on each of the last 9 days, as shown below.

142, 136, 125, 148, 150, 152, 115, 131, 136

Which measure of data does NOT describe a typical number of books checked out on these days?

A Mean

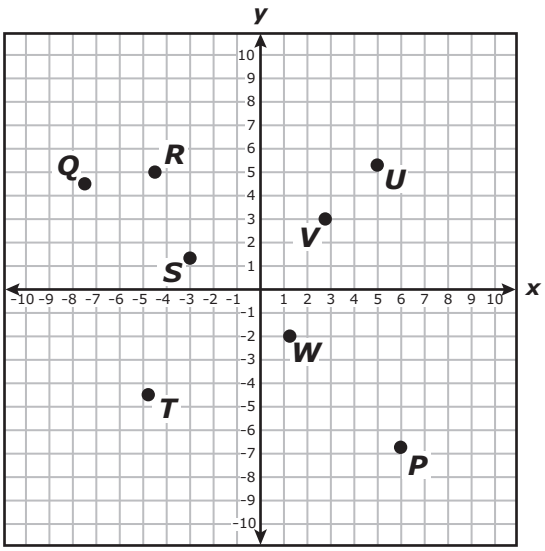
B Median

C Mode

D Range

GO ON

14 Which points on the coordinate grid below satisfy the conditions $x > -3\frac{1}{2}$ and $y < 1\frac{4}{5}$?



F Points *P* and *U*

G Points *Q*, *R*, and *T*

H Points *Q*, *S*, *T*, and *W*

J Points *P*, *S*, and *W*

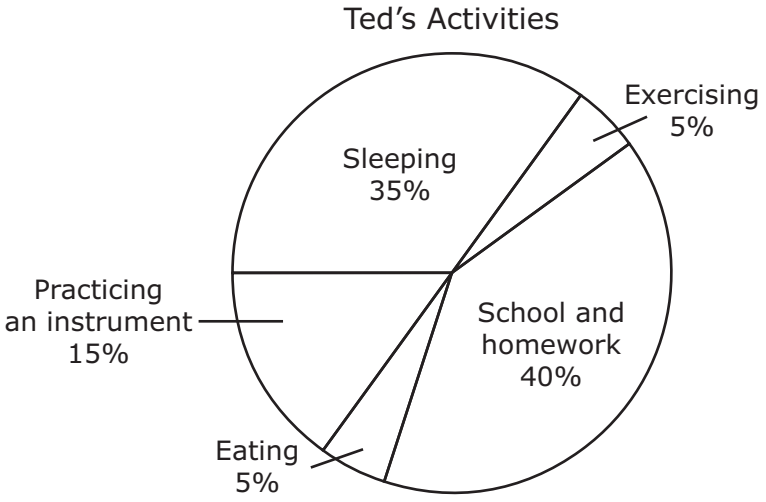
---

15 In 2011 Ralph paid $12.95 for a box of cards and $0.44 each for 16 stamps. What was the total cost, in dollars and cents, of the box of cards and the stamps?

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

GO ON

16 Ted created a graph to show the percentage of time he spends on different activities during a school day.



Ted concluded from the graph that he spends about 48 hours at school and doing homework during a five-day school week. Which statement about Ted's conclusion is true?

F Ted's conclusion is invalid because $\frac{1}{4}$ of 120 is 30.

G Ted's conclusion is invalid because 40% of 24 is 9.6.

H Ted's conclusion is valid because 40% of 120 is 48.

J Ted's conclusion is valid because $\frac{1}{4}$ of 192 is 48.

GO ON

17 Rachel rode her bicycle 18.2 miles in 1.4 hours. She determines that her mean speed was less than 17 miles per hour for this trip. Is she correct?

A No, because 1.4 added to 18.2 is 19.6

B No, because 18.2 multiplied by 1.4 is 25.48

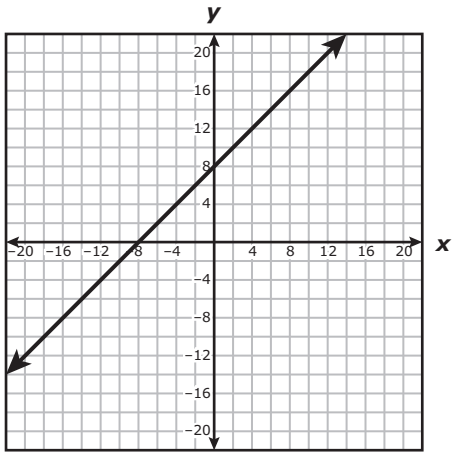
C Yes, because 1.4 subtracted from 18.2 is 16.8

D Yes, because 18.2 divided by 1.4 is 13

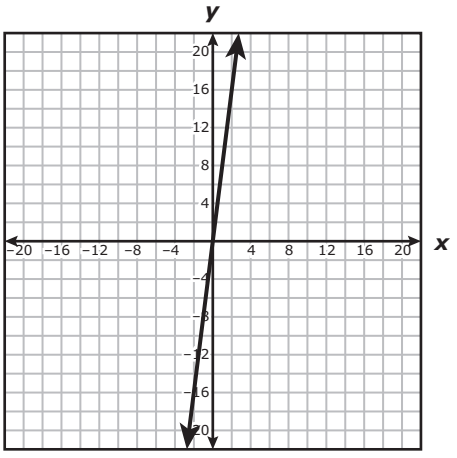
GO ON

18 The total number of washcloths, y, contained in x packages can be represented by the equation $y = 8x$. Which of the following graphs best represents this situation?

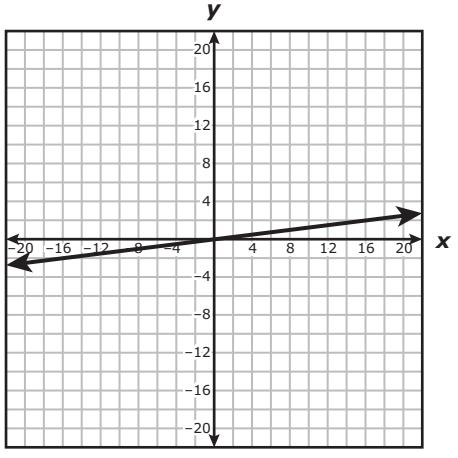
F



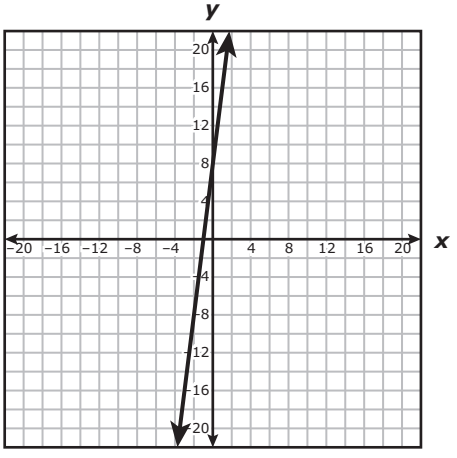
H



G



J



GO ON

19 A sphere is dilated by a scale factor of 1.04 to create a new sphere. How does the volume of the new sphere compare with the volume of the original sphere?

A The volume of the new sphere is 1.04 times the volume of the original sphere.

B The volume of the new sphere is $(1.04)^3$ times the volume of the original sphere.

C The volume of the new sphere is $(1.04)^2$ times the volume of the original sphere.

D The volume of the new sphere is $(2.08)^2$ times the volume of the original sphere.

---

20 Tobias has 12 coins in his pocket. Of these coins, 8 were made in the year 2000, and 4 were made in the year 2005. Tobias randomly selects one coin from his pocket and, without replacing it, selects another coin from his pocket. What is the probability that both coins he selects were made in the year 2000?

F $\frac{14}{33}$

G $\frac{4}{9}$

H $\frac{7}{33}$

J $\frac{2}{9}$

GO ON

21 A store sells a 5-pound bag of apples for $4.60. Which of the following is NOT an equivalent price per pound of apples?

A A 20-pound bag for $18.40

B A 12-pound bag for $11.04

C A 7-pound bag for $6.44

D A 15-pound bag for $9.20

---

22 Pia spends from $40 to $50 at the grocery store each week. She spends about 20% of the amount on vegetables and fruit. Which of the following is a reasonable estimate of the amount of money Pia will spend on vegetables and fruit at the grocery store during the next 3 weeks?

F $130

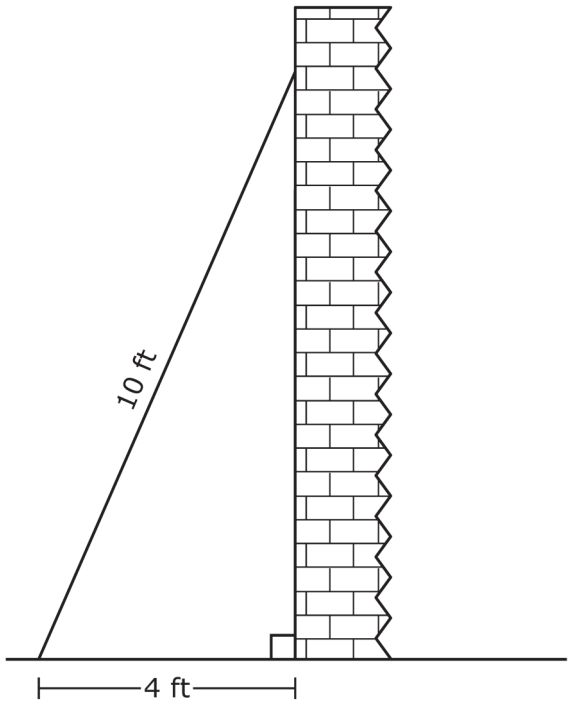
G $26

H $54

J $9

GO ON

23 A 10-foot ladder is leaning against a wall. The bottom of the ladder is 4 feet from the base of the wall, as shown below.



Which of the following is closest to the distance from the top of the ladder to the base of the wall?

A 9 ft

B 11 ft

C 6 ft

D 14 ft

GO ON

24 A company conducts research to predict how a new advertisement affects sales of a product. The equation below can be used to determine n, the number of people who buy the product if r people read the advertisement.

$$n = 0.08r + 7{,}400$$

If 7,496 people bought the product last week, how many people read the advertisement?

F 186,200

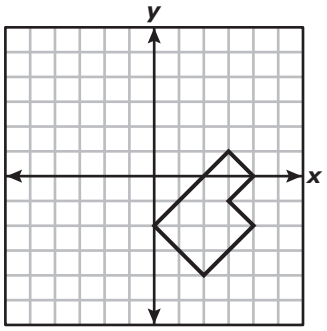
G 600

H 1,200

J 93,700

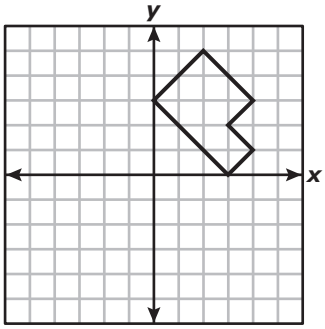
GO ON

25 The graph of a figure is shown below.

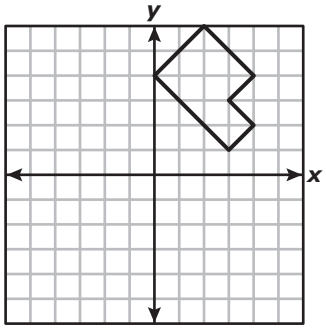


Which graph represents the reflection of this figure across the *x*-axis?

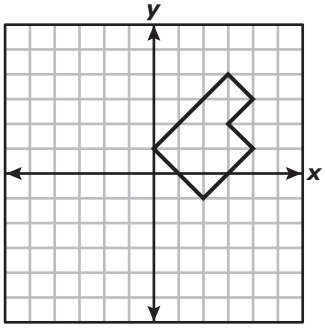
A



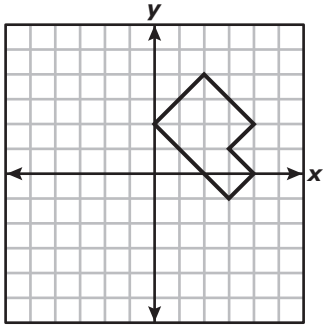
C



B



D



GO ON

26 Ramona is walking 10,000 feet for a fund-raiser. She walks at a rate of 270 feet per minute. This situation is modeled by the equation below, where d represents the remaining number of feet Ramona has to walk and t represents the number of minutes she has already walked.

$$d = 10{,}000 - 270t$$

Which table shows only values that satisfy this equation?

F

t	*d*
1	9,730
3	9,190
8	7,840
10	7,300

H

t	*d*
1	10,000
3	9,460
8	8,110
10	7,570

G

t	*d*
1	9,730
3	9,460
8	9,190
10	8,920

J

t	*d*
1	10,000
3	9,730
8	9,460
10	9,190

GO ON

27 Wendy had 35 tickets for games at a carnival. She used $\frac{1}{5}$ of the tickets to play the ball-toss game. She then used $\frac{1}{2}$ of the remaining tickets to play the ring-toss game, in which she won 5 more tickets. How many tickets did Wendy have after playing these games?

A 7

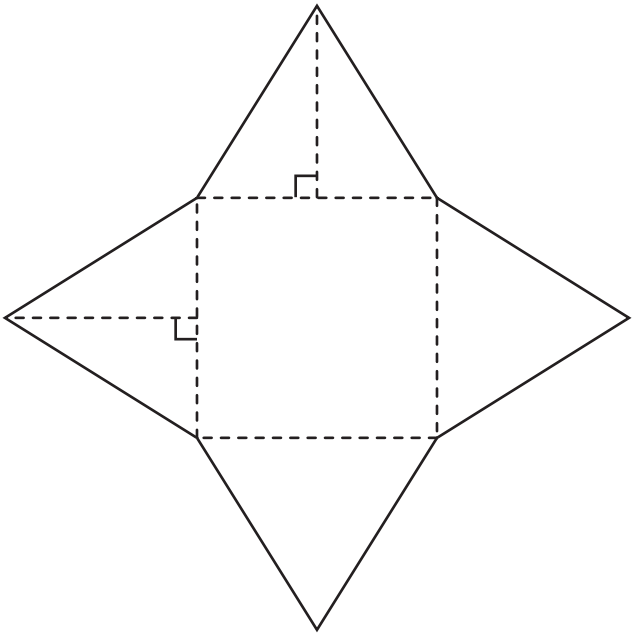
B 19

C 14

D 28

GO ON

28 The net of a square pyramid is shown below. Use the ruler provided to measure the dimensions of the net to the nearest $\frac{1}{4}$ inch.



Which of the following is closest to the lateral surface area of the pyramid?

F 2.5 $in.^2$

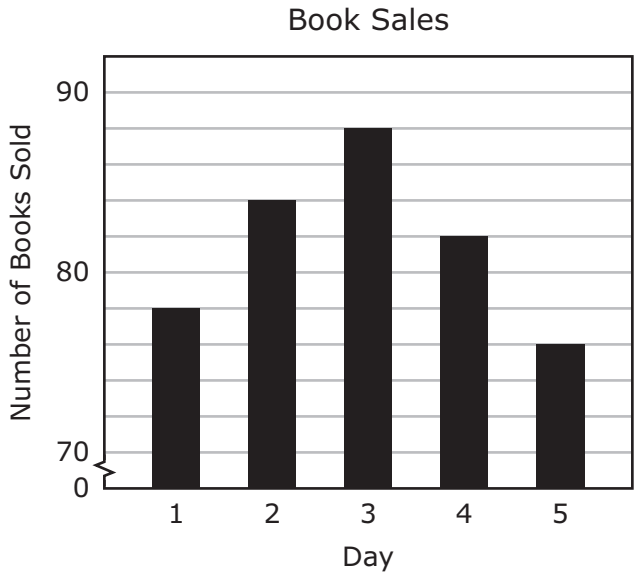
G 3.3 $in.^2$

H 6.6 $in.^2$

J 1.6 $in.^2$

GO ON

29 The graph below shows the number of books sold at a book fair in 5 days.



Based on the graph, which statement is true?

A The number of books sold on Day 3 was twice the number of books sold on Day 1.

B The number of books sold on Day 5 was half the number of books sold on Day 2.

C The number of books sold on Day 5 was about 93% of the number of books sold on Day 4.

D The number of books sold on Day 1 was about 12% of the number of books sold on Day 3.

GO ON

30 There are four students working on an assignment in a class. Mike has completed $\frac{1}{9}$ of the assignment, Gwen has completed 11% of the assignment, Jorge has completed 0.12 of the assignment, and Tai has completed $\frac{1}{8}$ of the assignment. Which of the following lists the students in order from least to greatest by the amount of the assignment they completed?

F Gwen, Mike, Jorge, Tai

G Tai, Jorge, Mike, Gwen

H Gwen, Jorge, Mike, Tai

J Tai, Mike, Gwen, Jorge

---

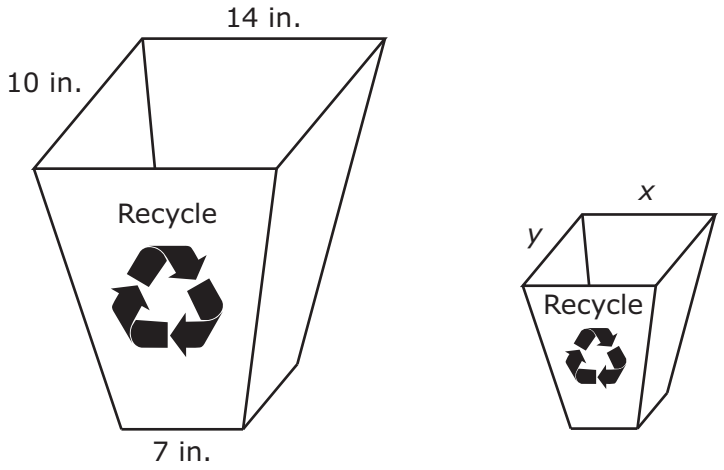
31 A cafeteria manager surveyed a random sample of students at a school to determine which of 2 meal choices they prefer. The results of the survey are shown below.

- Chicken is preferred by 30 students.
- Pasta is preferred by 18 students.

Based on the results of the survey, how many of the 240 students at the school can be expected to prefer chicken?

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

32 Mrs. Hussen has two similar recycling bins in her office. The dimensions of the smaller bin can be found by dilating the dimensions of the larger bin by a scale factor of 0.75.



What are the measurements of x and y on the smaller recycling bin?

F $x = 13.25$ in. and $y = 9.25$ in.

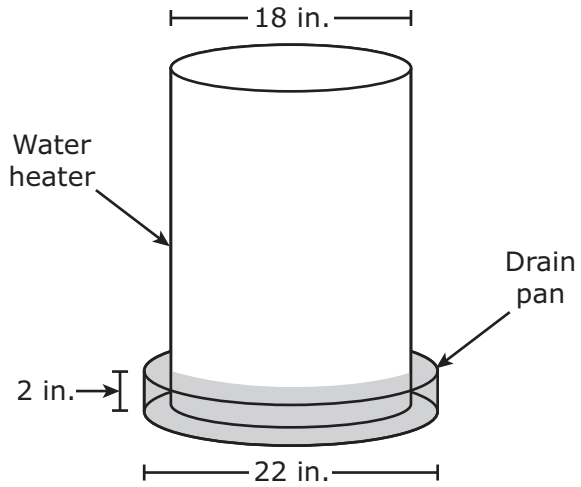
G $x = 10.5$ in. and $y = 6.5$ in.

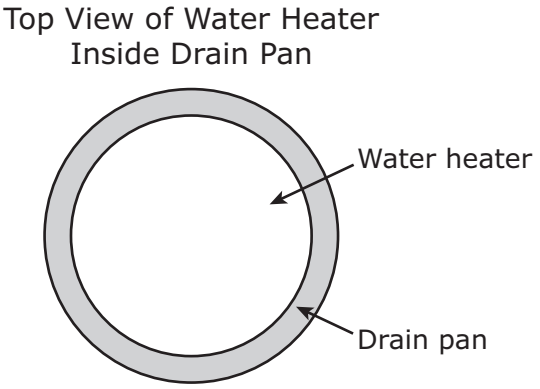
H $x = 11.5$ in. and $y = 7.5$ in.

J $x = 10.5$ in. and $y = 7.5$ in.

GO ON

33 A water heater has a diameter of 18 inches. It sits in a drain pan that has a diameter of 22 inches and a height of 2 inches, as modeled in the diagram below.





Water that leaks out of the water heater sits in the drain pan. Which of the following is closest to the maximum amount of water that the drain pan can contain with the water heater in the position shown?

A 13 $in.^3$

B 1,005 $in.^3$

C 251 $in.^3$

D 50 $in.^3$

GO ON

34 According to the Texas Parks and Wildlife Department, there are about 40 white-tailed deer per square mile in each of 35 Texas counties. A rectangular area on a ranch in one of these counties measures 2.25 miles by 6.7 miles. Which of the following is closest to the number of white-tailed deer expected to live in this rectangular area?

F 480

G 840

H 720

J 600

GO ON

35 Which equation best describes a relationship between x and y in the table below?

x	y
0	5
6	7
12	9
15	10

A $y = 3x + 5$

B $y = \frac{1}{5}x + 3$

C $y = \frac{1}{3}x + 5$

D $y = x + 5$

---

36 The average distance from Earth to the sun is about 9.3×10^7 miles. The average distance from Mars to the sun is about 1.4×10^8 miles. When both planets are at their average distance from the sun, how much farther is Mars from the sun than Earth?

F 79,000,000 mi

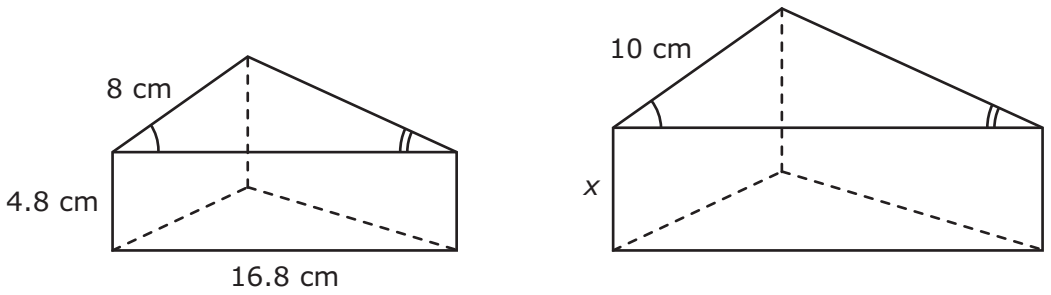
G 47,000,000 mi

H 107,000,000 mi

J 233,000,000 mi

GO ON

37 The two triangular prisms shown below are similar.



What is the value of x, the height of the larger prism?

A 6.8 cm

B 4 cm

C 6 cm

D 7.2 cm

---

38 Leslie has two cups containing different-colored paper clips. The first cup contains 7 pink paper clips and 3 blue paper clips. The second cup contains 3 black paper clips, 1 red paper clip, and 6 orange paper clips. What is the probability that Leslie will randomly select a blue paper clip from the first cup and then randomly select an orange paper clip from the second cup?

F $\frac{7}{8}$

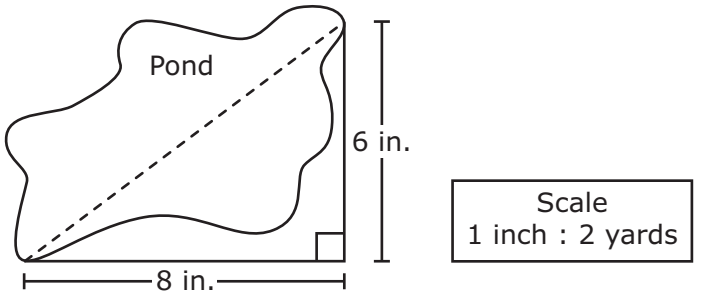
G $\frac{9}{10}$

H $\frac{9}{14}$

J $\frac{9}{50}$

GO ON

39 In the drawing below, the dashed line segment represents the distance across a pond.

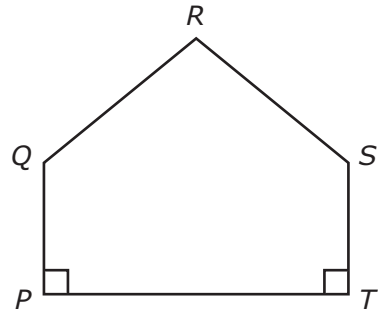


What is the actual distance, in yards, across the pond?

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

GO ON

40 Pentagon *PQRST* below models one side of a building.



The sum of the interior angles of the pentagon is 540°, the measure of angle *R* is 100°, and $\angle Q \cong \angle S$. What is the measure of $\angle Q$?

F 92°

G 130°

H 108°

J Not here

GO ON

41 Yadira made a wooden cone with a radius of 1.9 inches and a height of 15 inches. Which of the following is the best estimate of the volume of this cone?

A 60 $in.^3$

B 30 $in.^3$

C 180 $in.^3$

D 90 $in.^3$

---

42 Mr. Mauk surveyed 50 high school students in his driver-education course to determine how many times most motorists have taken a driver-education course. Which of the following best explains why the results of Mr. Mauk's survey may NOT be valid?

F He did not include motorists from other driver-education courses.

G He should have included adults who have taken driver-education courses.

H He should have included taxi drivers in his survey.

J The sample used in his survey may not have been representative of most motorists.

GO ON

43 Angie has 12 feet of string. She will cut the string into equal lengths of 5 inches each. How much string will be left after she cuts as many of these lengths as possible?

A 0.8 in.

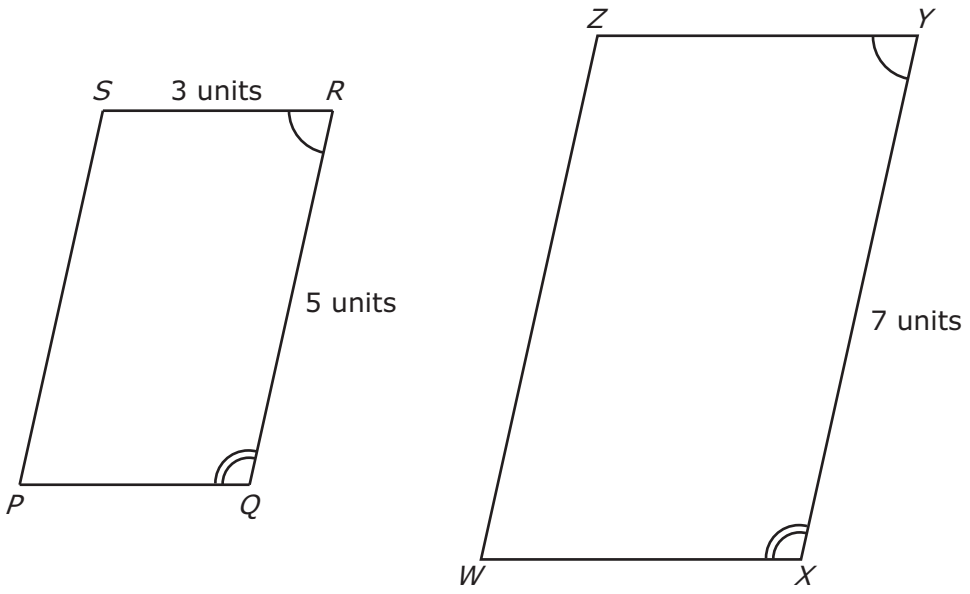
B 2 in.

C 4 in.

D 1.25 in.

GO ON

44 Parallelogram *PQRS* is similar to parallelogram *WXYZ*.



What is the length of $\overline{YZ}$?

F 3 units

G $11\frac{2}{3}$ units

H 5 units

J $4\frac{1}{5}$ units

GO ON

45 A package of 5 erasers costs $0.39. At this rate, how much would 60 erasers cost, in dollars and cents?

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

---

46 A regular pentagon is dilated by a scale factor of $\frac{3}{2}$ to create a new pentagon. Which of the following statements is true?

F The perimeter of the new pentagon is $\frac{9}{4}$ the perimeter of the original pentagon.

G The perimeter of the new pentagon is $\frac{9}{2}$ the perimeter of the original pentagon.

H The perimeter of the new pentagon is $\frac{15}{2}$ the perimeter of the original pentagon.

J The perimeter of the new pentagon is $\frac{3}{2}$ the perimeter of the original pentagon.

GO ON

47 A painter earns $119.00 for 7 hours of work. Which of the following is an equivalent rate?

A $120.50 for $8\frac{1}{2}$ hours of work

B $110.50 for $6\frac{1}{2}$ hours of work

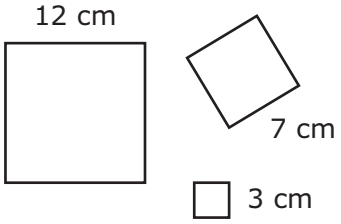
C $178.50 for $7\frac{1}{2}$ hours of work

D $153.50 for $9\frac{1}{2}$ hours of work

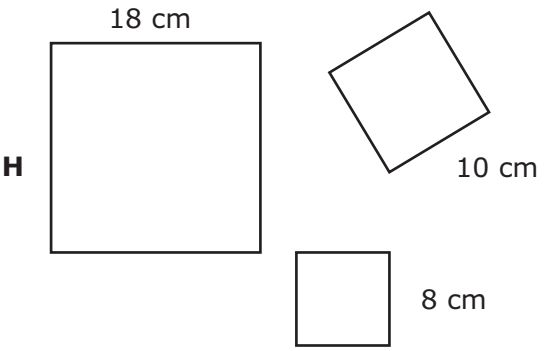
GO ON

48 Which group of three squares will form a right triangle when joined at their vertices?

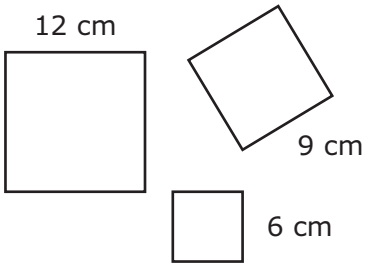
F



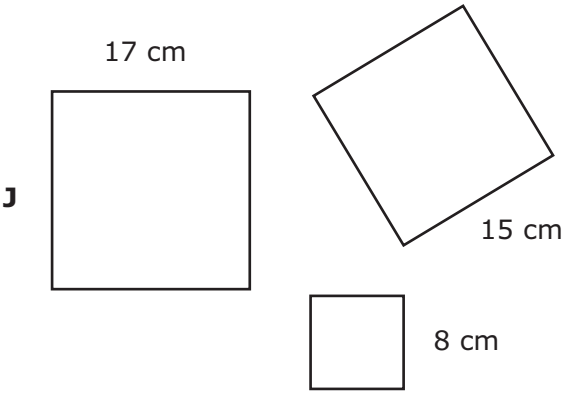
H



G

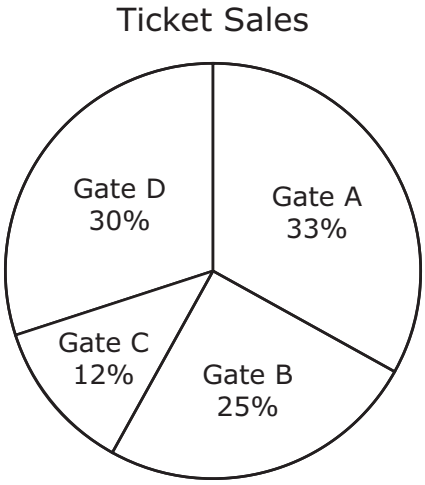


J



GO ON

49 Tickets were sold at four different gates of a high school football stadium. The graph below shows the percent of the total tickets sold at each gate during a recent game.



If 90 tickets were sold at Gate C, what was the total number of tickets sold?

A 750

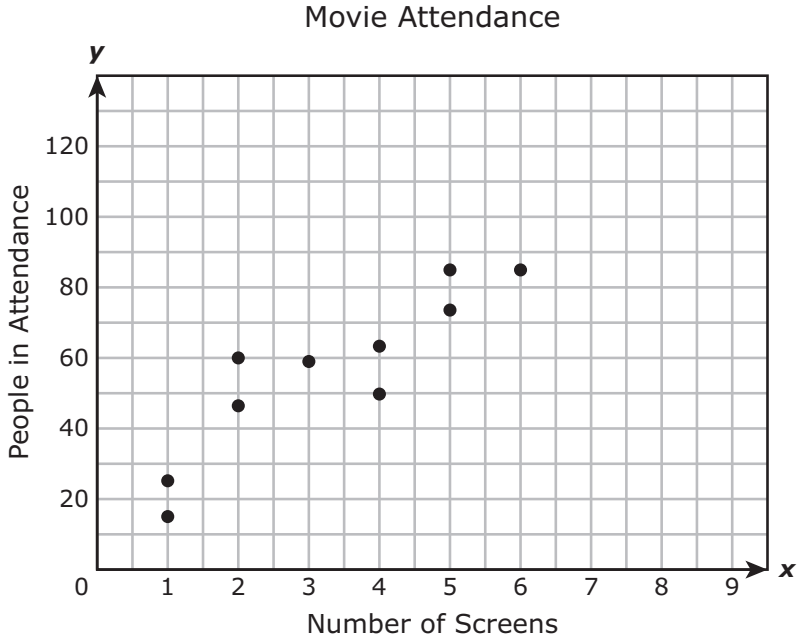
B 1,080

C 360

D 1,168

GO ON

50 The scatterplot below shows movie theaters with different numbers of screens and their average weekly attendance.



Based on the trend in the scatterplot, approximately how many people will be in attendance at a movie theater with 8 screens?

F 90

G 105

H 85

J 140

GO ON

51 A 7-inch candle burns at a rate of 2 inches an hour. Which equation represents the relationship between y, the height of the candle in inches, and x, the number of hours the candle burns?

A $y = 2x + 7$

B $y = 7 - 2x$

C $y = 2 - 7x$

D $y = 7x + 2$

---

52 A hotel charges guests $19.75 a day to rent 5 video games. At this rate, which expression can be used to determine the charge for renting 9 video games for 1 day at this hotel?

F $\frac{19.75}{5}(9)$

G $\frac{5}{19.75}(9)$

H $\frac{23.70}{5}(9)$

J $\frac{5}{23.70}(9)$

GO ON

53 A store manager discounted the prices of several items during a sale. The original price and the sale price of each item are shown in the table below.

Store Sale

Original Price	Sale Price
$30	$24
$40	$32
$50	$40
$60	$48
$70	$56

Based on the data in the table, what would be the sale price of an item that had an original price of $85?

A $79

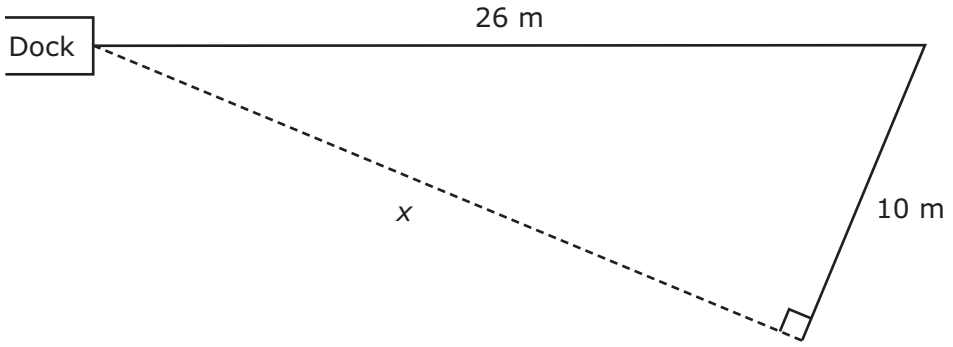
B $64

C $68

D $71

GO ON

54 Leland swam from the dock east 26 meters. He turned and swam another 10 meters, as shown in the diagram below.



What is the value of x, the distance Leland swam to return to the dock?

F 36 m

G 24 m

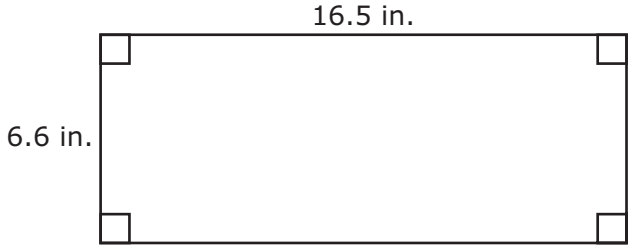
H 4 m

J 16 m

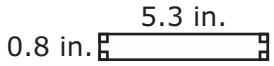
GO ON

55 A rectangle has a length of 7.5 inches and a width of 3 inches. This rectangle is dilated by a scale factor of 2.2 to create a new rectangle. Which figure represents the new rectangle?

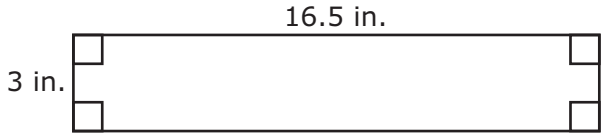
A



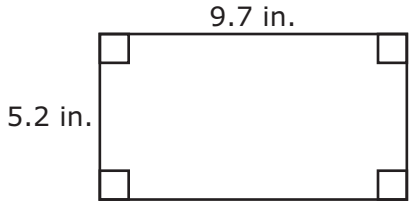
B



C



D



GO ON

56 The water levels of five Texas lakes were measured on the same day in 2010. The table below shows the number of feet above or below normal level for each lake.

Water Levels of Texas Lakes

Lake	Number of Feet Above or Below Normal Level
Conroe	0.10
Amistad	−2.65
Richland Chambers	0.16
Possum Kingdom	−1.43
Travis	0.07

Which list shows the numbers in the table from greatest to least?

F −2.65, −1.43, 0.16, 0.10, 0.07

G 0.16, 0.10, 0.07, −1.43, −2.65

H 0.16, 0.10, 0.07, −2.65, −1.43

J −2.65, −1.43, 0.07, 0.10, 0.16

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

STAAR
GRADE 8
Mathematics
April 2013

545596 1 2 3 4 5 A B C D E Printed in the USA ISD4717