STAAR®
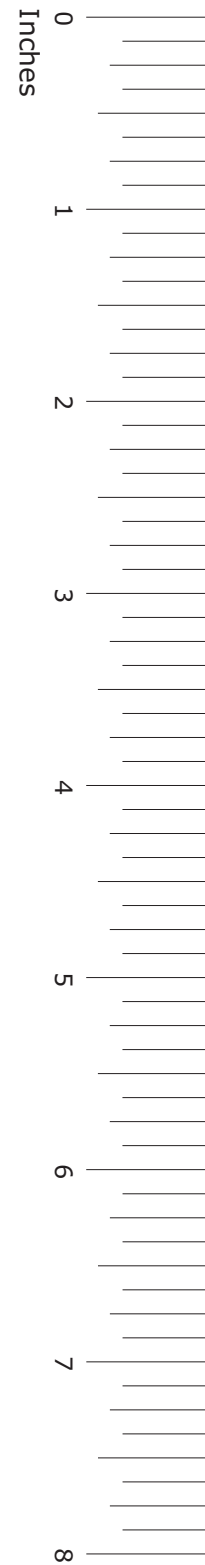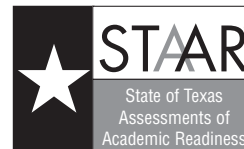
State of Texas Assessments of Academic Readiness

GRADE 7
Mathematics

Administered May 2022

RELEASED

STAAR GRADE 7 MATHEMATICS REFERENCE MATERIALS

LINEAR EQUATIONS

Slope-intercept form

$$y = mx + b$$

Constant of proportionality

$$k = \frac{y}{x}$$

CIRCUMFERENCE

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

AREA

Triangle

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

Rectangle or parallelogram

$$A = bh$$

Trapezoid

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

Circle

$$A = \pi r^2$$

VOLUME

Prism

$$V = Bh$$

Pyramid

$$V = \frac{1}{3}Bh$$

ADDITIONAL INFORMATION

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

Distance

$$d = rt$$

Simple interest

$$I = Prt$$

Compound interest

$$A = P(1 + r)^t$$

Inches

STAAR GRADE 7 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)

Centimeters
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
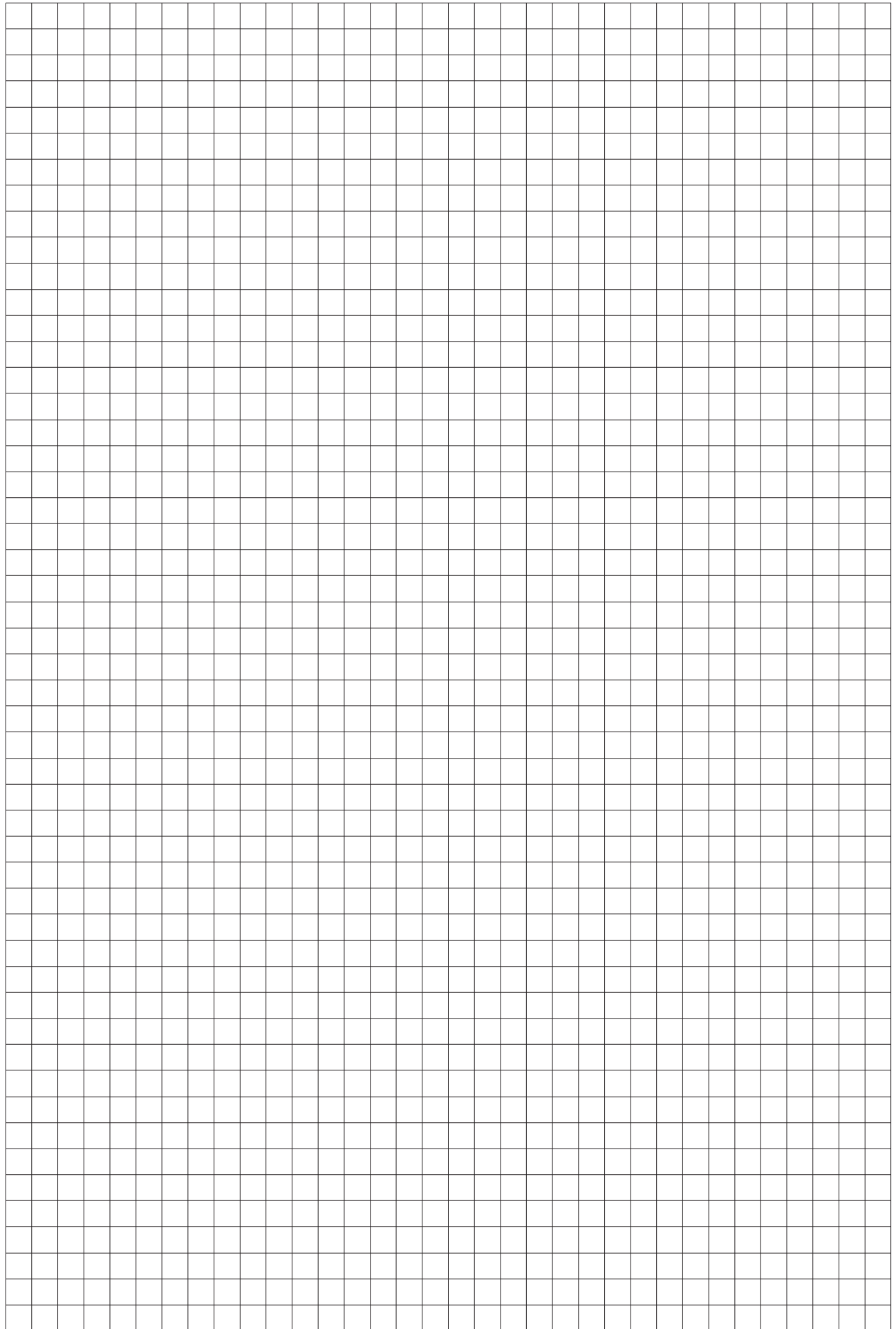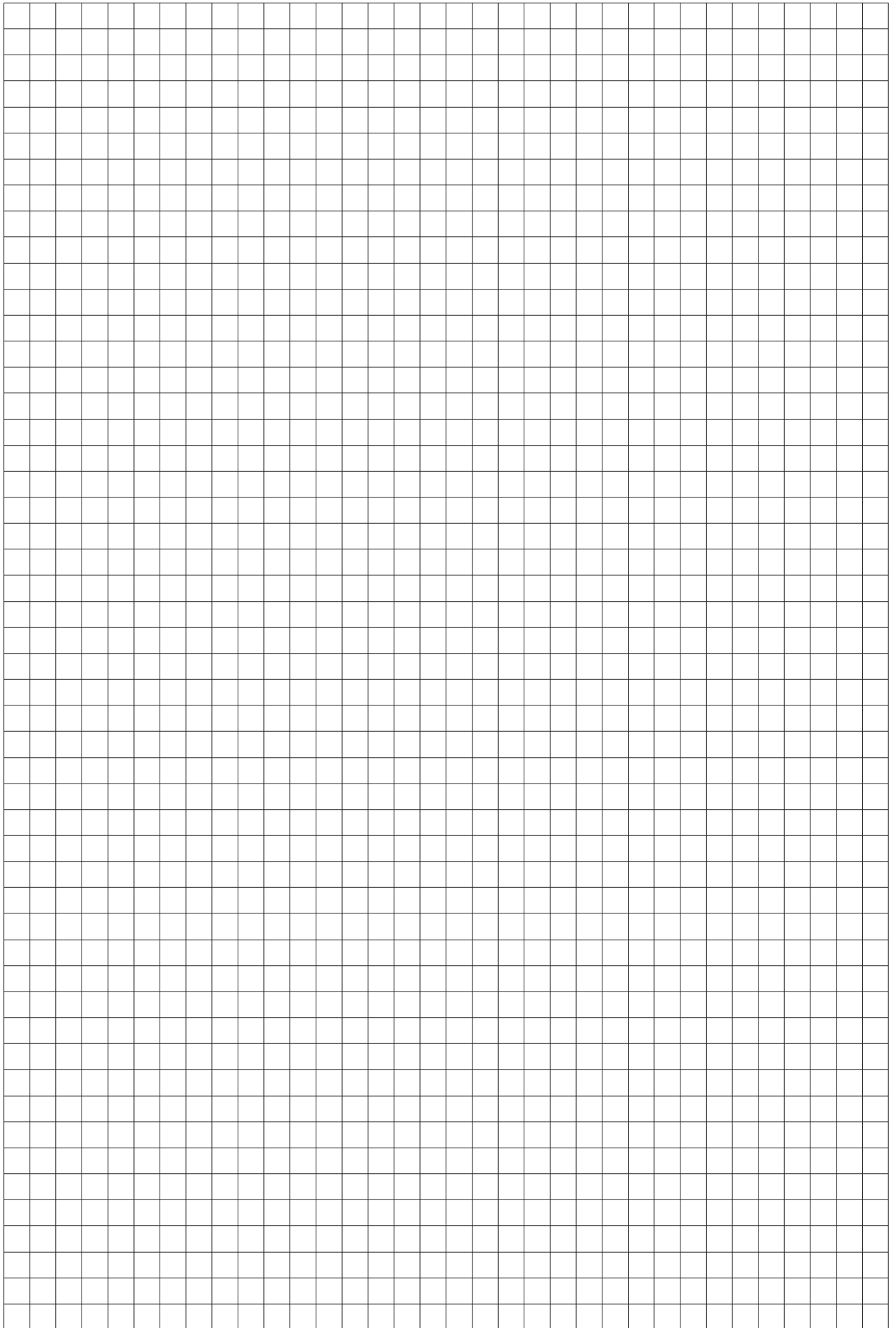
MATHEMATICS

1 The length of a ruler is 12 inches. There are approximately 25.4 millimeters in 1 inch.

Which measurement is closest to the length of the ruler in millimeters?

A 3,048 mm

B 30.48 mm

C 304.8 mm

D 3.048 mm

GO ON

2 The table shows the numbers of bags of different flavors of potato chips on a store shelf. A customer will randomly select one bag of potato chips from the shelf.
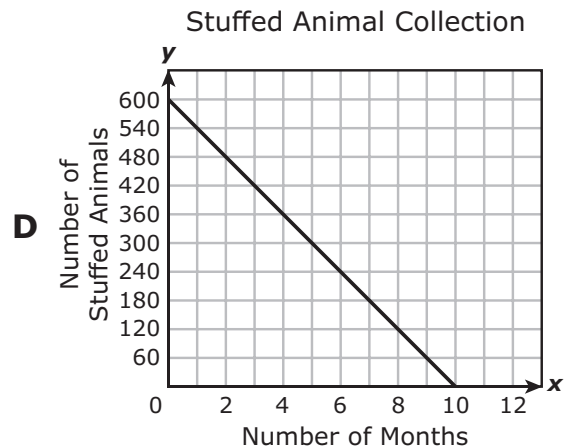
Potato Chips

Flavor	Number of Bags
Plain	12
Jalapeño	18
Ranch	8
Cheese	20

Which statement about the flavor of the potato chips chosen is best supported by the information in the table?

F The flavor is least likely to be plain.

G The flavor is twice as likely to be jalapeño as ranch.

H The flavor is equally likely to be plain, jalapeño, ranch, or cheese.

J The flavor is more than twice as likely to be cheese as it is to be ranch.

3 Nicole had a collection of 60 stuffed animals. She gave away 5 stuffed animals per month until all her stuffed animals were gone.

Which graph best represents this situation?

A

Stuffed Animal Collection

Number of Stuffed Animals

Number of Months

B

Stuffed Animal Collection

Number of Stuffed Animals

Number of Months

C

Stuffed Animal Collection

Number of Stuffed Animals

Number of Months

D

Stuffed Animal Collection

Number of Stuffed Animals

Number of Months

GO ON
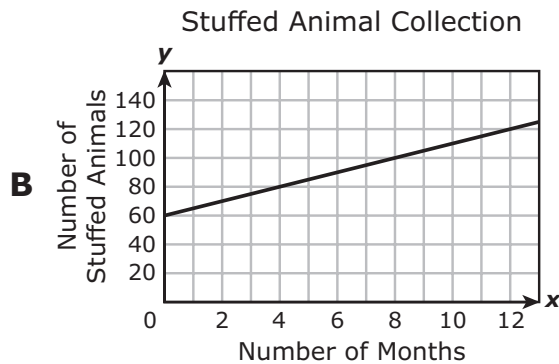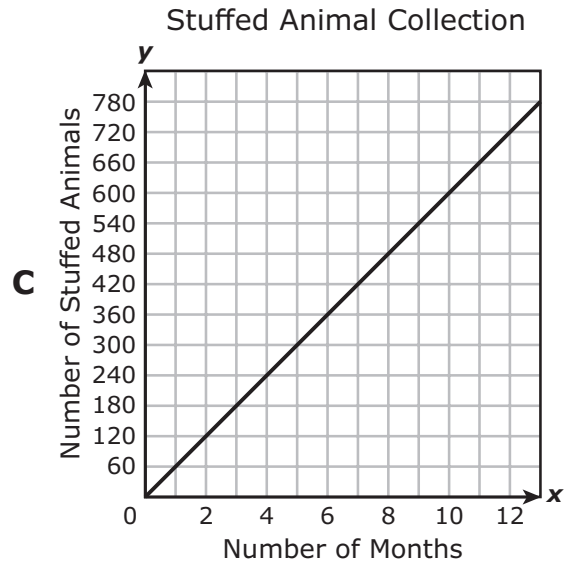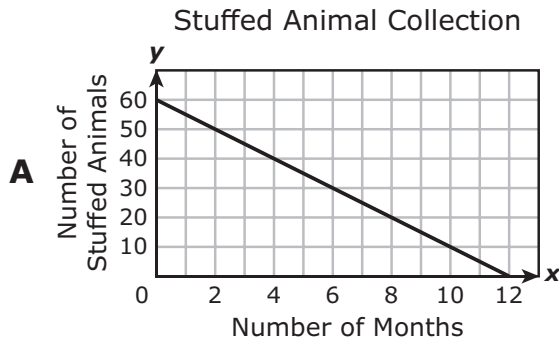
4 This figure is composed of a parallelogram and a trapezoid.

26 cm
32 cm
16 cm
40 cm
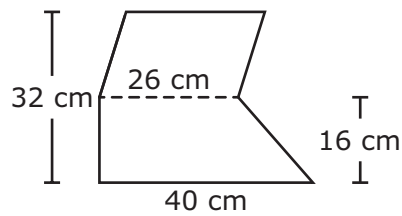
What is the area of the figure in square centimeters?

F 1,056 cm^2

G 1,360 cm^2

H 944 cm^2

J 528 cm^2

---

5 Triangle *QRS* and its dimensions are shown.

S

6 cm

12 cm

Q

15 cm

R
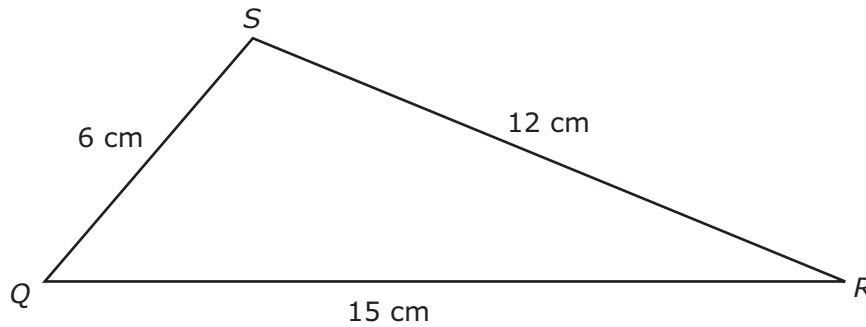
Which measurements in centimeters represent the dimensions of a triangle that is similar to triangle *QRS*?

A 8 cm, 14 cm, 17 cm

B 10 cm, 20 cm, 25 cm

C 4 cm, 10 cm, 13 cm

D 12 cm, 24 cm, 36 cm

GO ON

6 Which equation is true when $x = 4$?

F $3x + 4 = 8$

G $5x - 2 = 18$

H $2x + 8 = 40$

J $4x + 4 = 12$

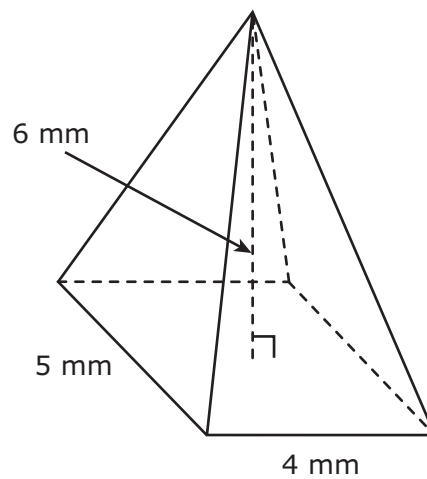**7** The dimensions of a rectangular pyramid are shown in the diagram.

6 mm

5 mm

4 mm

What is the volume of the rectangular pyramid in cubic millimeters?

A 15 mm^3

B 120 mm^3

C 60 mm^3

D 40 mm^3

8 Imani compared the number of fluid ounces per bottle of sunscreen to the cost of four different brands of sunscreen. The information she gathered is shown in the table.

Sunscreen Comparison

| Brand	Number of Fluid Ounces per Bottle	Cost
W	20	$12.00
X	15	$11.25
Y	10	$6.50
Z	5	$2.50

Based on the data in the table, which brand of sunscreen has the greatest cost per fluid ounce?

F Brand W

G Brand X

H Brand Y

J Brand Z

9 Chad will have new carpet put on the rectangular floors of two rooms in his house. One floor is $12\frac{1}{2}$ feet long, and the other floor is $15\frac{3}{4}$ feet long. Each floor has a width of 10 feet.

What is the total area in square feet of the new carpet?

A 125 ft^2

B 157.5 ft^2

C 282.5 ft^2

D 96.5 ft^2

---

10 A scientist measured the weights of squirrels in two populations. The dot plots display data from each population.

Population 1

Population 2

Squirrel Weight (ounces)

Squirrel Weight (ounces)
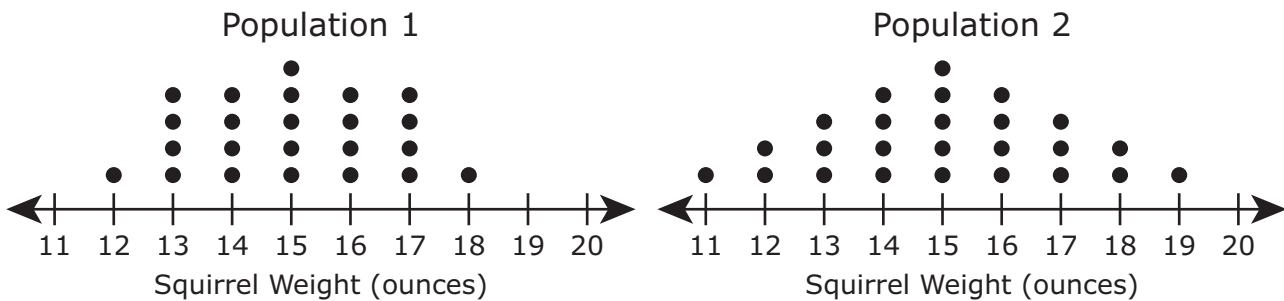
Which statement is best supported by the information in the dot plots?

F The two populations have different mode weights.

G The two populations have different median weights.

H The data for the two populations have different skews.

J The data for the two populations have different ranges.

GO ON

11 A survey was conducted to determine the types of occupations of the 1,200 residents of a town. The types of occupations are shown in the circle graph.
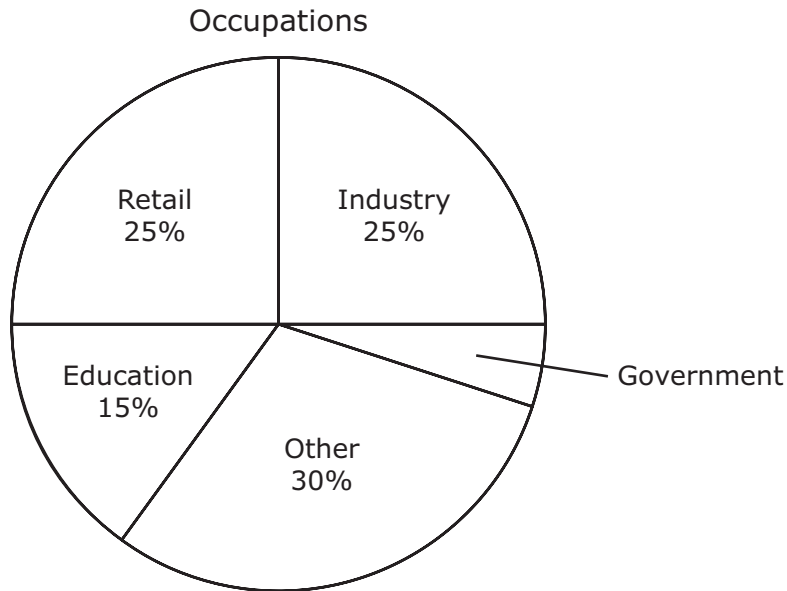
Occupations

Based on the circle graph, how many more residents have an occupation in industry than have an occupation in government?

A 20

B 360

C 240

D 300

---

12 One year on Venus is equivalent to 224.7 days on Earth. How many days on Earth, in decimal form, are equivalent to $9\frac{1}{2}$ years on Venus?

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

13 Use the ruler provided to measure the dimensions of the circle to the nearest centimeter.
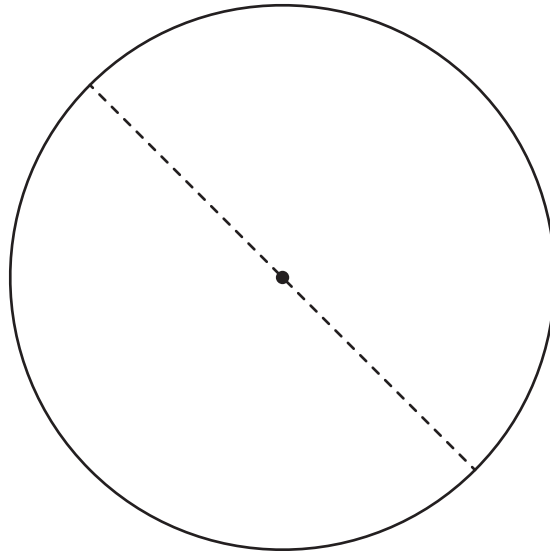
Which measurement is closest to the circumference of the circle in centimeters?

A 154 cm

B 11 cm

C 22 cm

D 38 cm

14 A bookstore offered mystery bags each containing 12 books. The quantity of each type of book was the same in each mystery bag. A shopper bought 3 mystery bags and found that 6 books were spy novels.

Based on this information, which prediction can the shopper make about buying mystery bags in the future?

F There will be 4 more spy novels in 8 bags than in 6 bags.

G There will be 2 more spy novels in 6 bags than in 4 bags.

H There will be 1 more spy novel in 9 bags than in 8 bags.

J There will be 6 more spy novels in 10 bags than in 8 bags.

15 A dog eats 1.25 cups of dog food twice a day. Which graph best represents this relationship?

A

Dog Food Eaten

Number of Cups (y-axis), Number of Days (x-axis)

C

Dog Food Eaten

Number of Cups (y-axis), Number of Days (x-axis)

B

Dog Food Eaten

Number of Cups (y-axis), Number of Days (x-axis)

D

Dog Food Eaten

Number of Cups (y-axis), Number of Days (x-axis)
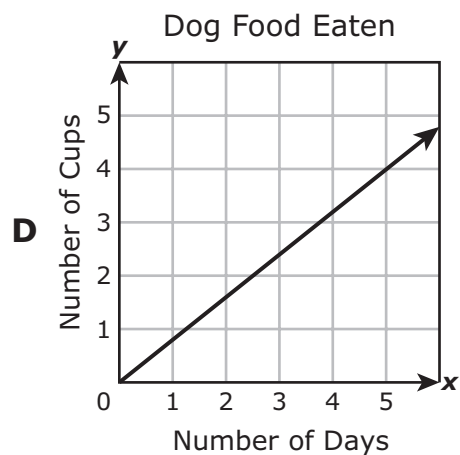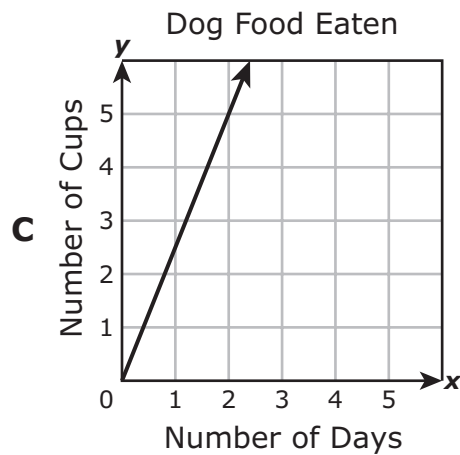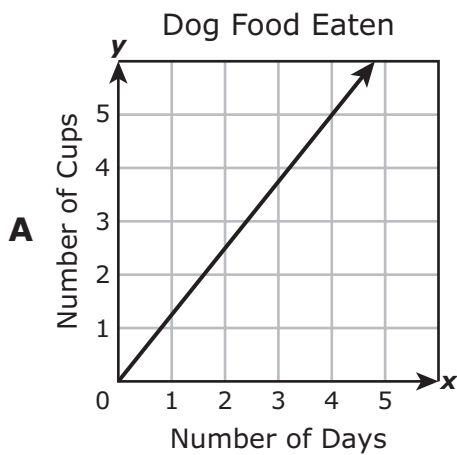
16 The table shows the numbers of different colors of pencils in a pencil case. A student will randomly select one pencil from the pencil case.

Colored Pencils

Color	Number of Pencils
Red	2
Purple	8
Blue	4
Green	5

Based on the information in the table, which statement is true?

F The pencil is least likely to be blue.

G The pencil is 4 times as likely to be purple as it is to be red.

H The pencil is equally likely to be blue or green.

J The pencil is more likely to be purple than all other colors combined.

---

17 Which number line represents the solution to the inequality $3x - 8 \geq 7$?

A

B

C

D

GO ON
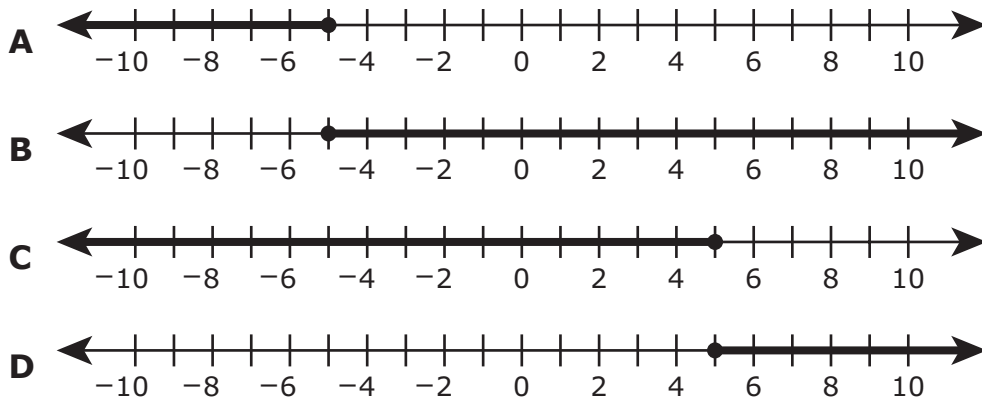
18 Angle *F* and angle *H* are supplementary angles.

- The measure of angle *F* is 77°.

- The measure of angle *H* is $(5x + 18)°$.

Which equation can be used to find the value of *x*?

F $77 = 5x + 18$

G $77 + (5x + 18) = 180$

H $77 + (5x + 18) = 90$

J $77 + (5x + 18) = 360$

19 A spinner with 6 equal sections is shown.
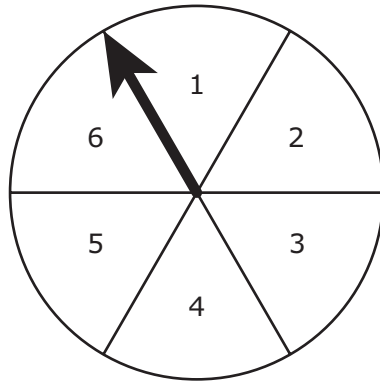
What is the probability of spinning a number greater than 4?

A $\frac{1}{6}$

B $\frac{2}{3}$

C $\frac{1}{2}$

D $\frac{1}{3}$

GO ON

20 Which equation represents the linear relationship between the *x*-values and the *y*-values in the table?

x	y
−1	−11
1	1
3	13
5	25

F $y = 2x + 12$

G $y = 5x - 6$

H $y = 6x - 5$

J $y = -x - 11$

21 A sidewalk in the shape of two triangles, a rectangle, and a square was built around the edge of a building as shown.
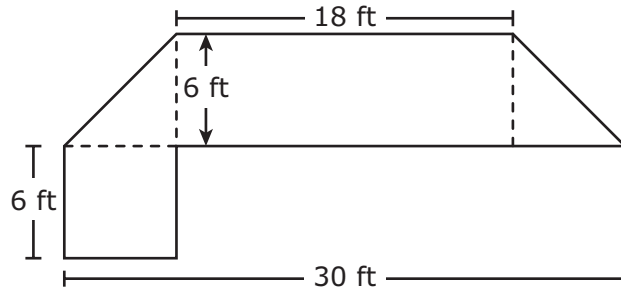
What is the area of the sidewalk in square feet?

A 108 ft^2

B 162 ft^2

C 144 ft^2

D 180 ft^2

---

22 The price of a computer is $899.00. The sales tax rate is 7%. What is the sales tax on this computer in dollars and cents?

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

GO ON

23 An online game increases in number of users at a rate of 500 users each day. Which graph best represents the relationship between y, the number of users, and x, the number of days?
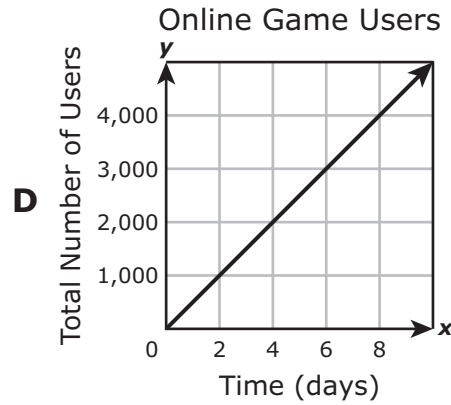
A

Online Game Users

Total Number of Users (y-axis: 0, 1, 2, 3, 4)
Time (days) (x-axis: 500, 1,000, 1,500, 2,000)

C

Online Game Users

Total Number of Users (y-axis: 500, 1,000, 1,500, 2,000)
Time (days) (x-axis: 0, 1, 2, 3, 4)

B

Online Game Users

Total Number of Users (y-axis: 250, 500, 750, 1,000)
Time (days) (x-axis: 0, 10, 20, 30, 40)

D

Online Game Users

Total Number of Users (y-axis: 1,000, 2,000, 3,000, 4,000)
Time (days) (x-axis: 0, 2, 4, 6, 8)
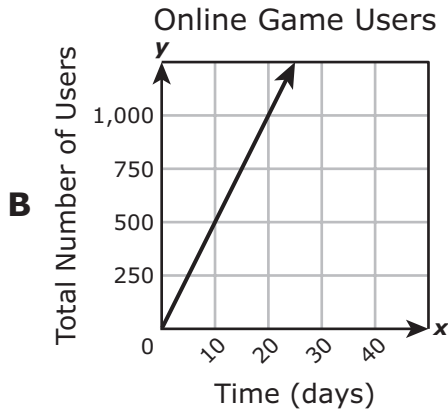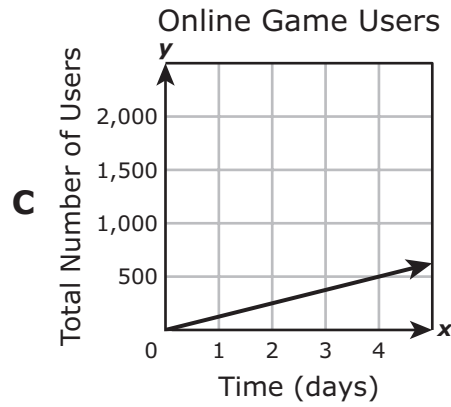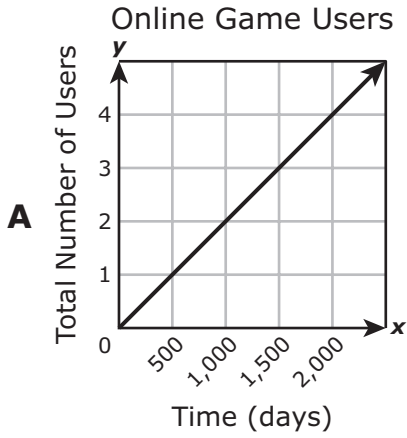
24 The radius of circle S is half the radius of circle L. The radius of circle L is 8 millimeters.

Which measurement is closest to the area of circle S in square millimeters?

F 50.24 mm^2

G 25.12 mm^2

H 200.96 mm^2

J 12.56 mm^2

---

25 Which situation is best represented by the following equation?

$$68.50x + 127.95 = 675.95$$

A An office manager paid $675.95 to build a web site. The office manager bought a software package for $68.50 and paid an employee $127.95 for each hour she worked on the website. What is x, the number of hours the employee worked on the website?

B An office manager paid $675.95 for computer equipment. The office manager bought one monitor for $127.95 and hard drives for $68.50 each. What is x, the number of hard drives the office manager bought?

C A sales manager paid $675.95 for advertising. The sales manager paid $127.95 per hour for consulting and received a $68.50 discount. What is x, the number of hours the manager paid for consulting?

D A business owner paid a total of $675.95 for two employees to work the same number of days. The business owner paid one employee $68.50. The business paid a second employee $127.95 per day. What is x, the number of days the employees worked?

GO ON

26 Regina has three number cubes. The faces of each number cube are numbered from 1 to 6. Regina will roll each number cube one time.

What is the probability that all three number cubes will land on an odd number?

F $\frac{1}{2}$

G $\frac{1}{6}$

H $\frac{1}{3}$

J $\frac{1}{8}$

---

27 What is the solution set for this inequality?

$$-5d + 5\frac{1}{2} \leq 17$$

A $d \geq -2\frac{3}{10}$

B $d \leq -2\frac{3}{10}$

C $d \leq -4\frac{1}{2}$

D $d \geq -4\frac{1}{2}$

28 The net of a triangular prism and its approximate dimensions are shown in the diagram.

4 in.

12 in.

12 in.

10.4 in.

12 in.

12 in.

12 in.
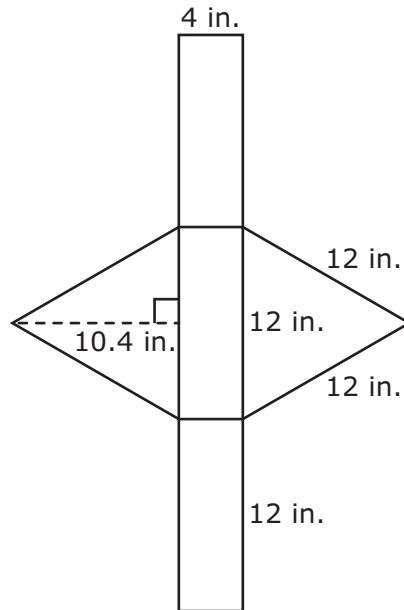
Which measurement is closest to the total surface area of the triangular prism in square inches?

F 268.8 in.^{2}

G 432 in.^{2}

H 288 in.^{2}

J 393.6 in.^{2}

29 The manager of a coffee shop recorded the number of customers who put vanilla creamer or chocolate creamer in their coffee during one hour and classified them by age. The results are shown in the table.

Coffee Creamer

	Vanilla	Chocolate
Age 18–30	2	6
Age 31+	4	8

What percentage of these customers put chocolate creamer in their coffee during this hour?

A 30%

B 14%

C 70%

D 75%

---

30 An engineer created a scale drawing of a building using a scale in which 0.25 inch represents 2 feet. The length of the actual building is 250 feet.

What is the length in inches of the building in the scale drawing?

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

31 The box plots summarize the number of semester hours students enrolled in a university and a community college completed during the fall semester.

Fall Semester

Number of Semester Hours
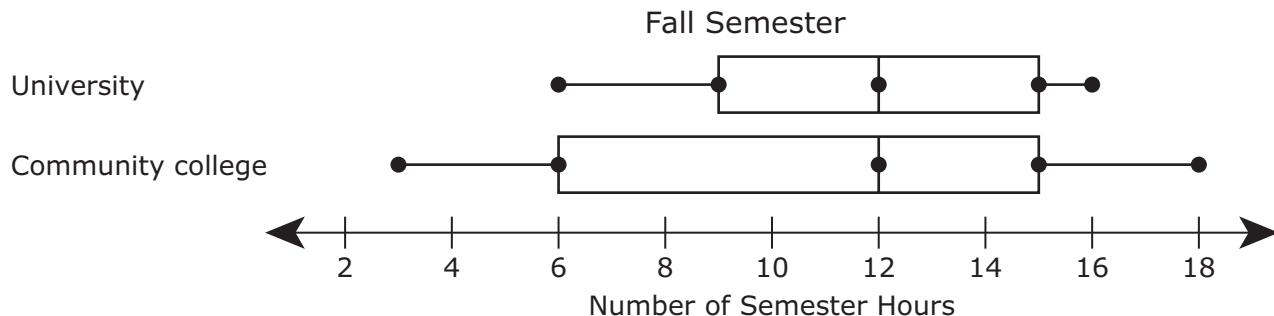
Which statement is best supported by the data in the box plots?

A The median of the data for the university is greater than the median of the data for the community college.

B The range of the data for the university is greater than the range of the data for the community college.

C The interquartile range of the data for the community college is greater than the interquartile range of the data for the university.

D The third quartile of the data for the community college is greater than the third quartile of the data for the university.

32 Alice has a loan of $24,820. This loan has a simple interest rate of 3.5% per year. No payments will be made on the loan until the end of one year.

How much interest will Alice pay on this loan at the end of one year?

F $868.70

G $72.39

H $8,687.00

J $25,688.70

33 A student has a set of cards. Each card has a picture of one shape. The table shows the number of cards that have a picture of each shape. The student will randomly select one card from the set.

Shape Cards

Shape	Number of Cards
Circle	8
Pentagon	12
Rectangle	10
Square	6
Triangle	4

Which statement is true?

A The probability of selecting a card with a picture of a circle is $\frac{5}{8}$, and the probability of selecting a card that is not a picture of a circle is $\frac{3}{8}$.

B The probability of selecting a card with a picture of a circle is $\frac{3}{8}$, and the probability of selecting a card that is not a picture of a circle is $\frac{5}{8}$.

C The probability of selecting a card with a picture of a circle is $\frac{1}{5}$, and the probability of selecting a card that is not a picture of a circle is $\frac{4}{5}$.

D The probability of selecting a card with a picture of a circle is $\frac{4}{5}$, and the probability of selecting a card that is not a picture of a circle is $\frac{1}{5}$.

34 The model represents an equation.

□ x	□ x	□ x	△ 1 △ 1		△ 1 △ 1 △ 1 △ 1 △ 1
□ x	□ x		△ 1 △ 1	=	△ 1 △ 1 △ 1 △ 1 △ 1
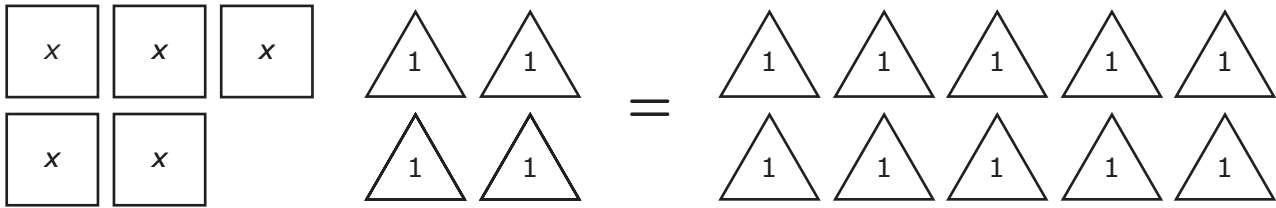
What is the solution for the equation?

F $x = \dfrac{14}{5}$

G $x = \dfrac{6}{5}$

H $x = \dfrac{5}{4}$

J $x = \dfrac{15}{4}$

---

35 A survey showed that 8 out of 20 homeowners in a neighborhood had cable television. If there were 320 homeowners in the neighborhood, how many could be expected to have cable television?

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

36 Students were surveyed to determine their favorite types of animals. The bar graph shows the number of students who selected each type of animal.
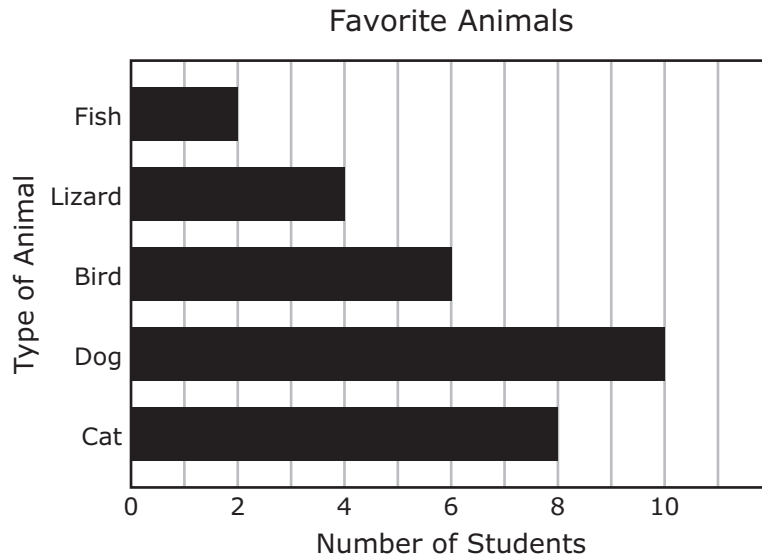
Favorite Animals

What percentage of the students surveyed selected "Bird" as their favorite type of animal?

F 20%

G 5%

H 6%

J 80%

37 A principal has given a class $75 to help pay for a field trip to a zoo. The students in the class are selling pies for $5 each to earn the rest of the money they need. The field trip will cost a total of $386.

Which inequality can be used to find p, the number of pies the class needs to sell in order to earn enough money to pay for the field trip?

A $5p + 75 \leq 386$

B $5p + 75 \geq 386$

C $75p + 5 \geq 386$

D $75p + 5 \leq 386$

---

38 The dimensions of a rectangular prism are 1.5 feet by 3.5 feet by 2 feet. What is the volume of the rectangular prism in cubic feet?

F 7 ft^3

G 7.25 ft^3

H 8.5 ft^3

J 10.5 ft^3

39 The circumference of a circle is C inches. The diameter of the circle is 19 inches.

Which expression best represents the value of π?

A $\dfrac{C}{19}$

B $\dfrac{19}{C}$

C $\dfrac{C}{9.5}$

D $\dfrac{9.5}{C}$

40 A monthly budget for a small family is shown.

Family Budget

Item	Amount
Mortgage payment	$800
Food	$600
Transportation	$360
Childcare	$540
Health insurance	$750
Miscellaneous	$580

Which equation can be used to find b, the minimum amount of money the family must earn annually in order to meet this budget?

F $b = \$3{,}630 \times 12$

G $b = \$3{,}630 \times 52$

H $b = \$43{,}560 \div 52$

J $b = \$43{,}560 \div 365$

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

STOP