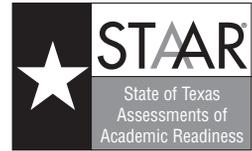


GRADE 6
Mathematics

Administered April 2013

RELEASED

STAAR GRADE 6 MATHEMATICS REFERENCE MATERIALS



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

Inches

0

1

2

3

4

5

6

7

8

STAAR GRADE 6 MATHEMATICS REFERENCE MATERIALS

PERIMETER

Square

$$P = 4s$$

Rectangle

$$P = 2l + 2w$$

CIRCUMFERENCE

Circle

$$C = 2\pi r$$

or

$$C = \pi d$$

AREA

Triangle

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

or

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

Square

$$A = s^2$$

Rectangle

$$A = lw$$

or

$$A = bh$$

Parallelogram

$$A = bh$$

Trapezoid

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

or

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

Circle

$$A = \pi r^2$$

VOLUME

Cube

$$V = s^3$$

Rectangular prism

$$V = lwh$$

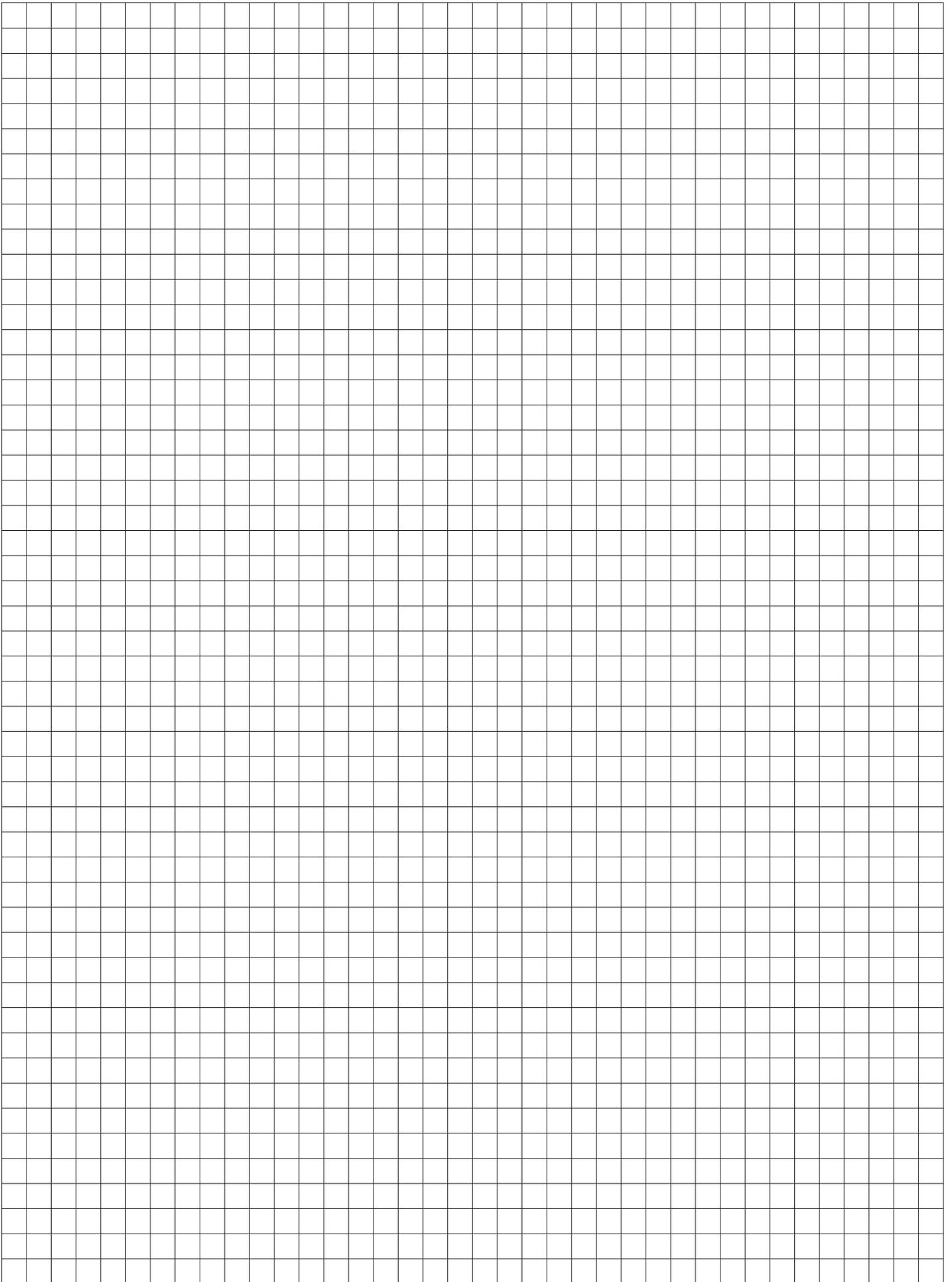
or

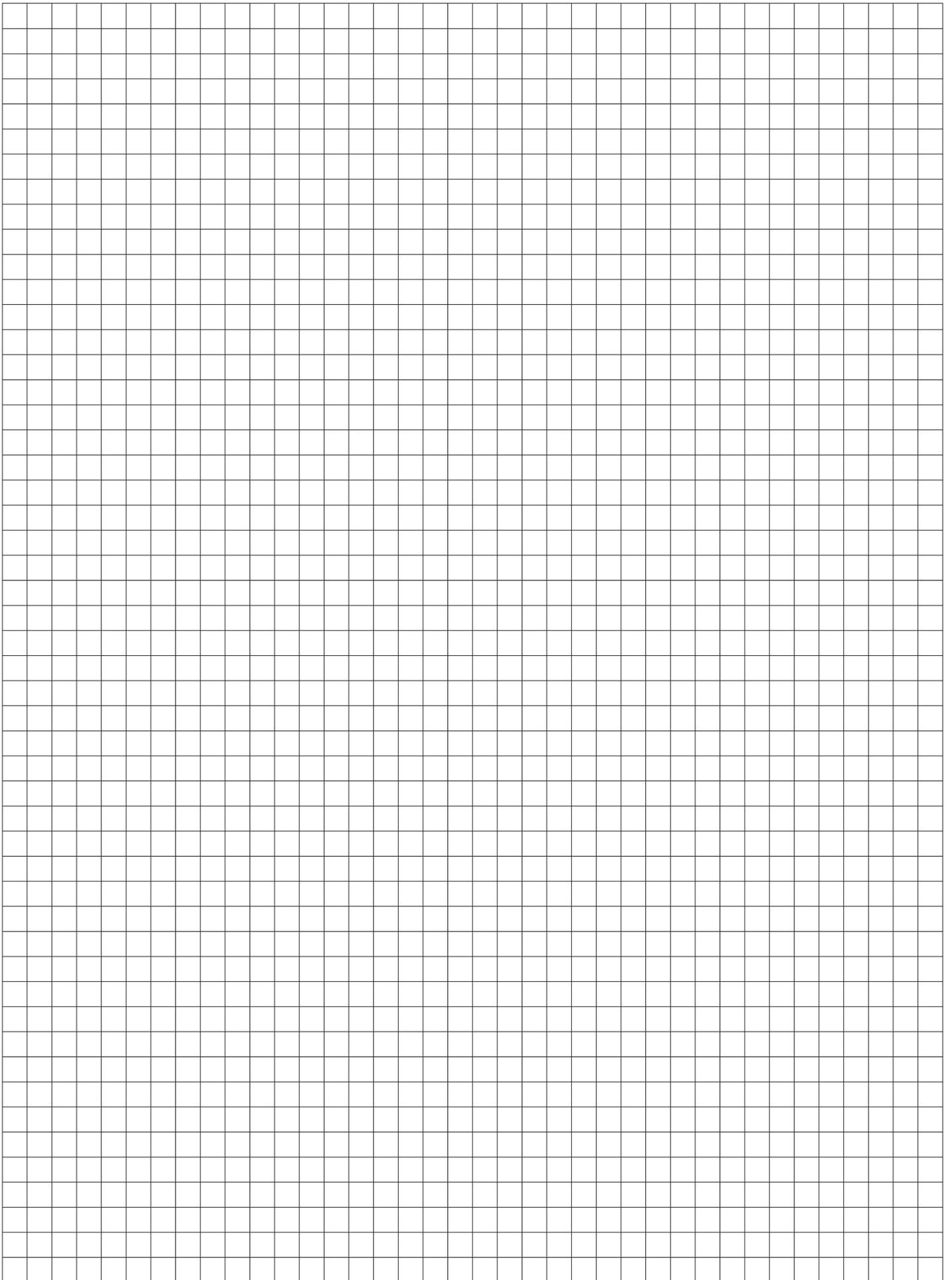
$$V = Bh$$

ADDITIONAL INFORMATION

Pi

$$\pi \approx 3$$





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 list below shows the number of rides at nine different rodeos.

28, 7, 13, 7, 8, 12, 22, 14, 6

What is the median number of rides at these rodeos?

- A 8
- B 22
- C 7
- D 12

-
- 2 The radius of a circular clock face is 13 centimeters. Which expression can be used to find the circumference of the clock face in centimeters?

- F $\pi \times 13$
- G $\pi \times 2$
- H $2 \times \pi \times 13$
- J $2 \times \pi \div 13$

- 3** At a school on Friday, 3 out of every 4 students were wearing jeans. There were 600 students at school on Friday. How many of the students were wearing jeans?
- A** 599, because $600 - (4 - 3) = 599$
- B** 450, because $\frac{3}{4} = \frac{450}{600}$
- C** 50, because $600 \div (4 \times 3) = 50$
- D** 800, because $\frac{3}{4} = \frac{600}{800}$

- 4 The numbers in each set shown below have a common characteristic.

Set S		Set T	
0.8	$\frac{60}{100}$	0.4	$\frac{20}{100}$
$\frac{5}{9}$	0.57	$\frac{4}{9}$	0.04

Which statement best describes a common characteristic of the numbers in Set S or Set T?

- F** Each number in Set T is less than $\frac{1}{4}$.
- G** Each number in Set S is less than 0.65.
- H** Each number in Set T is greater than $\frac{1}{2}$.
- J** Each number in Set S is greater than 0.5.

- 5 Kenji has a collection of rectangular prisms of different heights. Each rectangular prism has a length of 5 cm and a width of 2 cm. The table below shows the relationship between each rectangular prism's volume, V , and the rectangular prism's height, h .

Kenji's Collection of Prisms

Volume, V (cm^3)	Height, h (cm)
20	2
90	9
160	16
230	23

Which equation can be used to find V , the volume in cubic centimeters of a rectangular prism in Kenji's collection?

- A $10h = V$
- B $7h = V$
- C $h = 7V$
- D $h = 10V$

-
- 6 Mia is $2\frac{1}{2}$ years older than Chloe. Allen is $6\frac{1}{2}$ years younger than Chloe. Mia is 12 years old.

What is Allen's age?

- F $14\frac{1}{2}$ years
- G 3 years
- H 8 years
- J $18\frac{1}{2}$ years

- 7 The pictograph below shows the number of samples of matter being tested in an experiment.

Matter Being Tested

Liquid	
Solid	
Gas	

Each  represents 5 samples.

Which statement is best supported by the information in the pictograph?

- A There are a total of 10 samples being tested in this experiment.
- B The ratio of the number of gas samples being tested to the number of liquid samples is 1 to 10.
- C The difference between the number of solid samples being tested and the number of gas samples is 3.
- D The ratio of the number of liquid samples being tested to the total number of samples is 1 to 2.

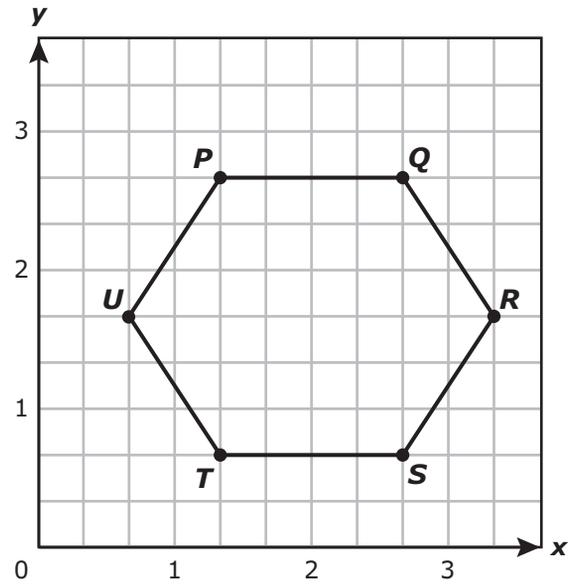
8 Stephanie and Tamara both started running a race at 8:15 A.M. Stephanie finished the race in 4 hours 30 minutes. Tamara finished the race in 1 hour 15 minutes after Stephanie did. At what time did Tamara finish the race?

- F** 2:00 P.M.
- G** 12:45 P.M.
- H** 1:00 P.M.
- J** Not here

9 On a spelling test Carlos had to spell 25 words. He earned 4 points for every word he spelled correctly. Which equation can be used to find p , the total number of points Carlos earned for spelling w words correctly?

- A** $p = w(25 - 4)$
- B** $p = 4(25 - w)$
- C** $p = 4w$
- D** $p = 4 + w$

10 A polygon is shown on the coordinate grid.



The list below shows ordered pairs representing the location of five vertices of the polygon.

$$\left(2\frac{2}{3}, \frac{2}{3}\right), \left(\frac{2}{3}, 1\frac{2}{3}\right), \left(1\frac{1}{3}, \frac{2}{3}\right), \left(1\frac{1}{3}, 2\frac{2}{3}\right), \left(3\frac{1}{3}, 1\frac{2}{3}\right)$$

Which vertex is NOT represented by an ordered pair in the list?

- F Vertex *P*
- G Vertex *Q*
- H Vertex *R*
- J Vertex *S*

- 11** Fred went to an arcade to play video games. He paid \$2 for every 11 tokens he bought. He spent a total of \$16 on tokens. Which equation can be used to determine t , the number of tokens Fred bought?

A $\frac{2}{16} = \frac{t}{11}$

B $\frac{2}{11} = \frac{t}{16}$

C $\frac{18}{t} = \frac{11}{2}$

D $\frac{11}{2} = \frac{t}{16}$

-
- 12** What is the prime factorization of 196?

F $2^2 \cdot 7^2$

G $2 \cdot 7^2$

H $2 \cdot 7 \cdot 14$

J $2^2 \cdot 49$

- 13 The value of m can be determined by using the expression $(0.05 + j)$. Which table represents the relationship between the values of m and j ?

A

j	8.5	9	9.5	10
m	9	9.5	10	10.5

B

j	8.55	9.05	9.55	10.05
m	8.5	9	9.5	10

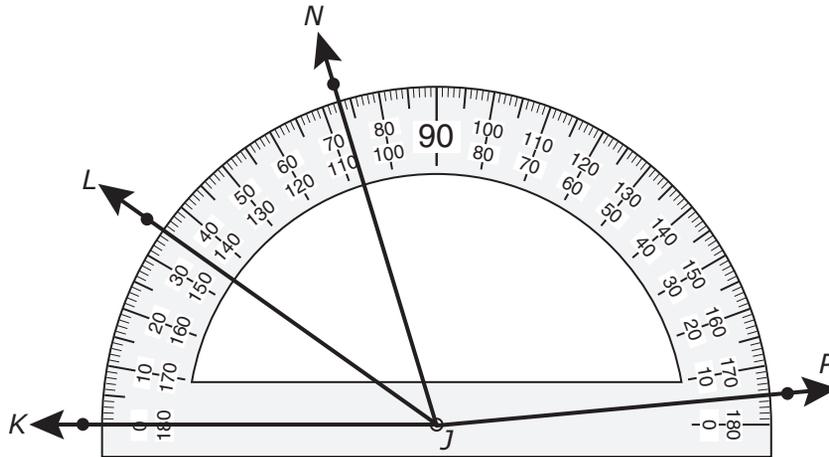
C

j	8.5	8.55	8.6	8.65
m	9.5	9.55	9.6	9.65

D

j	8.5	9	9.5	10
m	8.55	9.05	9.55	10.05

14 Angle NJP and angle KJL are shown below.

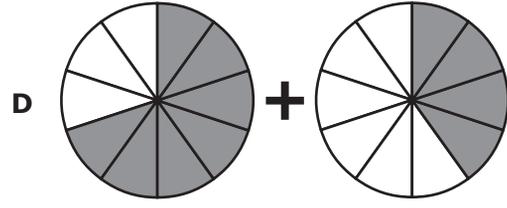
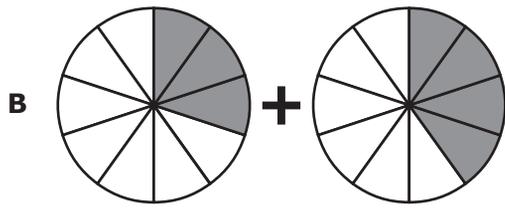
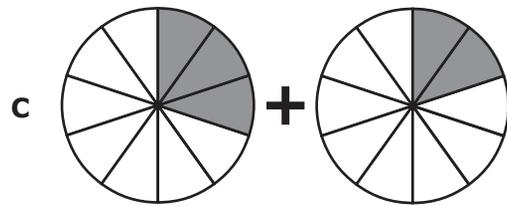
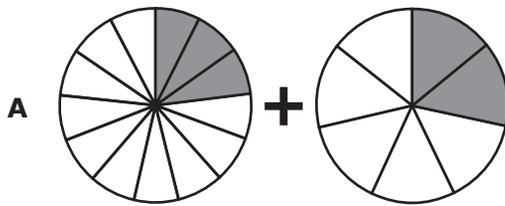


What is the difference between the measures of angle NJP and angle KJL to the nearest degree?

- F 107°
- G 67°
- H 102°
- J 35°

15 Which model is shaded to best represent the expression below?

$$\frac{3}{10} + \frac{2}{5}$$



16 The students in a science class spent 85% of their class period performing an experiment. What decimal is equivalent to 85%?

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

17 Mona is buying a new car.

- She can choose a car with 2 doors or 4 doors.
- She can choose seat covers made of leather, fabric, or vinyl.
- She can choose a car color of silver, black, or white.

The list below shows some of the possible outcomes of 1 number of doors, 1 type of seat cover, and 1 color.

2 doors, leather, silver	2 doors, leather, black	2 doors, leather, white
2 doors, fabric, silver	2 doors, fabric, black	2 doors, fabric, white
4 doors, leather, silver	4 doors, leather, black	4 doors, leather, white
4 doors, fabric, silver	4 doors, fabric, black	4 doors, fabric, white

Which list shows all the other possible outcomes of 1 number of doors, 1 type of seat cover, and 1 color?

- A**

2 doors, vinyl, silver	2 doors, vinyl, black	2 doors, vinyl, white
------------------------	-----------------------	-----------------------
- B**

4 doors, vinyl, silver	4 doors, vinyl, black	4 doors, vinyl, white
------------------------	-----------------------	-----------------------
- C**

2 doors, vinyl, silver	2 doors, vinyl, black	2 doors, vinyl, white
4 doors, vinyl, silver	4 doors, vinyl, black	4 doors, vinyl, white
- D**

2 doors, vinyl, silver	4 doors, vinyl, black	2 doors, vinyl, white
4 doors, vinyl, silver	4 doors, vinyl, black	2 doors, vinyl, white

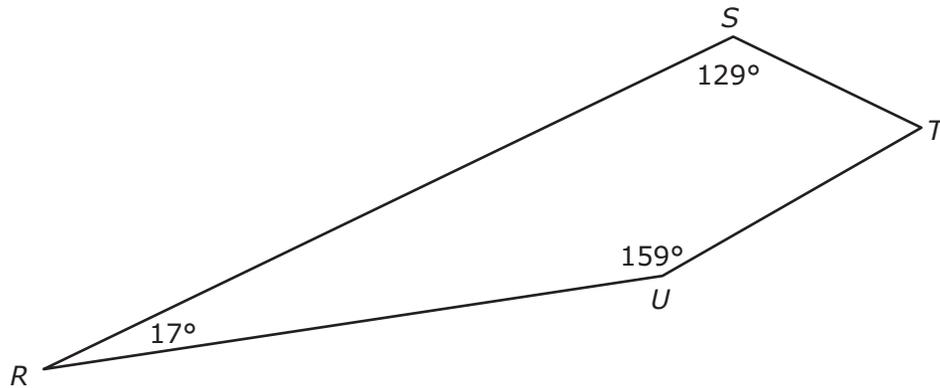
18 Each of three students wrote an equation.

- Nikole wrote $5\frac{2}{8} = \frac{21}{4}$.
- Erik wrote $5.14 = \frac{21}{4}$.
- Keisha wrote $4\frac{1}{5} = \frac{21}{4}$.

Which of these students wrote an equation that is true?

- F** Nikole only
- G** Nikole and Erik only
- H** Keisha only
- J** Nikole, Erik, and Keisha

19 Which statement about figure $RSTU$ is true?



- A The difference between the measures of $\angle T$ and $\angle R$ is 4° .
- B The difference between the measures of $\angle S$ and $\angle T$ is 95° .
- C The sum of the measures of $\angle R$, $\angle S$, and $\angle T$ is 201° .
- D The sum of the measures of $\angle R$, $\angle T$, and $\angle U$ is 193° .

- 20** A pizza chef at a restaurant uses the same amount of tomato sauce to make each pizza. The table below shows the relationship between the number of pizzas made, n , and the number of gallons of tomato sauce used, g .

Tomato Sauce for Pizzas

Number of Pizzas, n	80	112	144	176
Number of Gallons of Tomato Sauce, g	5	7	9	11

Based on the information in the table, which expression can be used to find g , the number of gallons of tomato sauce needed to make n pizzas?

- F** $n \times 16$
- G** $n - 75$
- H** $\frac{n}{16}$
- J** $n + 32$

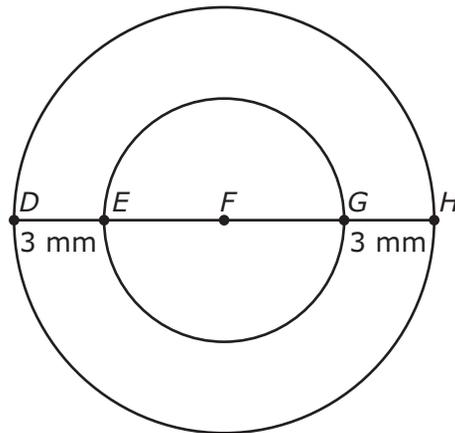
-
- 21** The list below shows the rate at which Riley burned calories by doing different activities last week.

- Playing basketball: burned 11 calories per minute
- Jogging: burned 9 calories per minute
- Swimming: burned a total of 600 calories in 2 hours

Riley did each of these activities for 2 hours last week. Based on the information in the list, which statement is true?

- A** He burned 1,200 calories per hour while swimming, because $600 \times 2 = 1,200$.
- B** He burned a total of 3,000 calories, because $(11 \times 120) + (9 \times 120) + 600 = 3,000$.
- C** He burned 1,080 calories per hour while jogging, because $9 \times 120 = 1,080$.
- D** He burned a total of 74,400 calories, because $(11 \times 120) + (9 \times 120) + (600 \times 120) = 74,400$.

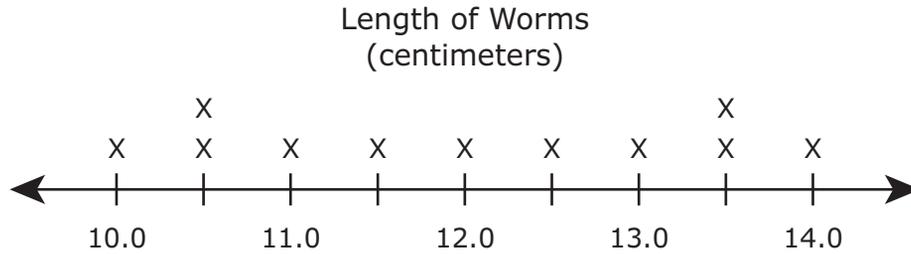
- 22** The diagram below shows 2 circles with the same center at point F . Points E , F , and G are on line segment DH . The diameter of the larger circle is 14 mm.



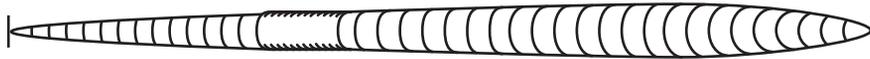
What is the radius of the smaller circle?

- F** 4 mm
 - G** 7 mm
 - H** 11 mm
 - J** 8 mm
-
- 23** At a swimming pool, Hector swam between 9 and 21 laps each day. Each lap is 26.8 m long. Hector swam at this pool 10 days. Which of the following is a reasonable estimate of the total number of meters Hector swam?
- A** 1,000 m
 - B** 9,000 m
 - C** 4,500 m
 - D** 1,800 m

- 24 William made the line plot below to show the length of 11 worms he found in his garden.



After he completed the line plot, he found a twelfth worm, which is modeled below. Use the ruler provided to measure the length of the worm to the nearest 0.5 centimeter.



If the data for the twelfth worm are added to the line plot, which statement would be true?

- F** Exactly $\frac{1}{2}$ of the worms have a length that is less than 12.5 cm.
- G** For every worm that is 14.0 cm long, there are two worms that are 12.0 cm long.
- H** For every worm that is 11.0 cm long, there is one worm that is 11.5 cm long.
- J** Exactly $\frac{2}{3}$ of the worms have a length that is greater than 11.0 cm.

25 The measurements in the list below have a characteristic in common.

- 2 miles
- 72,000 inches
- 3,000 feet

Which statement describes the common characteristic?

- A** Each measurement is less than 4,000 yards.
- B** Each measurement is greater than 1,760 yards.
- C** Each measurement is equivalent to 1,000 yards.
- D** Each measurement is equivalent to 3,520 yards.

26 Information about three circles is listed below.

- Circle *P* has a diameter of 26 cm.
- Circle *Q* has a diameter of 52 cm.
- Circle *R* has a radius of 52 cm.

Based on this information, which statement is true?

- F** The diameter of circle *P* is the same length as the diameter of circle *R*.
- G** The radius of circle *P* is the same length as the radius of circle *Q*.
- H** The diameter of circle *P* is the same length as the radius of circle *Q*.
- J** The radius of circle *P* is the same length as the diameter of circle *R*.

27 María bought 8 cups of strawberries. She used $1\frac{1}{2}$ cups of the strawberries to make a salad and $3\frac{3}{8}$ cups of the strawberries to make a pie. She needs 4 cups of strawberries to make milk shakes. Does María have enough strawberries left to make the milk shakes?

A No, because $8 - \left(3\frac{3}{8} + 1\frac{4}{8}\right) = 3\frac{1}{8}$, and $3\frac{1}{8} < 4$

B Yes, because $8 - 3\frac{3}{8} = 4\frac{5}{8}$, and $4\frac{5}{8} > 4$

C No, because $\left(8 - 3\frac{3}{8}\right) - 4 = \frac{5}{8}$, and $\frac{5}{8} < 4$

D Yes, because $8 + 3\frac{3}{8} + 1\frac{1}{2} = 12\frac{7}{8}$, and $12\frac{7}{8} > 4$

28 In a first-aid kit the ratio of large bandages to small bandages is 3 to 2. Based on this ratio, how many large bandages are in the kit if there are a total of 80 bandages?

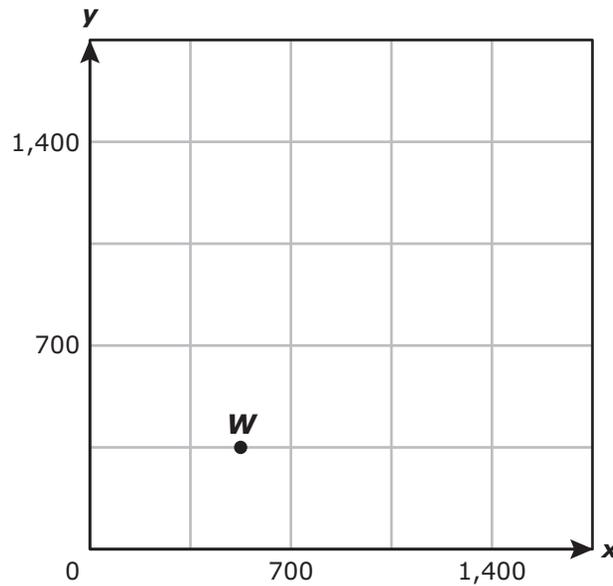
F 32

G 48

H 16

J 40

- 29 Which ordered pair appears to be located 350 units to the right and 700 units up from point W ?



- A (1,050, 875)
- B (700, 1,050)
- C (875, 1,050)
- D (1,225, 700)

-
- 30 Mitsu will be randomly assigned to a seat on an airplane. There are a total of 50 seats on the plane. Of these seats, 16 are aisle seats, and the rest are window seats. What decimal represents the probability that Mitsu will be assigned to a window seat?

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

- 31** Which number is equivalent to $\frac{13}{2}$?
- A** 6.1, because $13 \div 2 = 6$ with a remainder of 1
- B** $\frac{26}{2}$, because $13 \times 2 = 26$, and $2 \times 1 = 2$
- C** $6\frac{1}{2}$, because $13 \div 2 = 6$ with a remainder of 1
- D** 6.05, because $13 \div 2 = 6\frac{1}{2}$, and $\frac{1}{2} = 0.05$

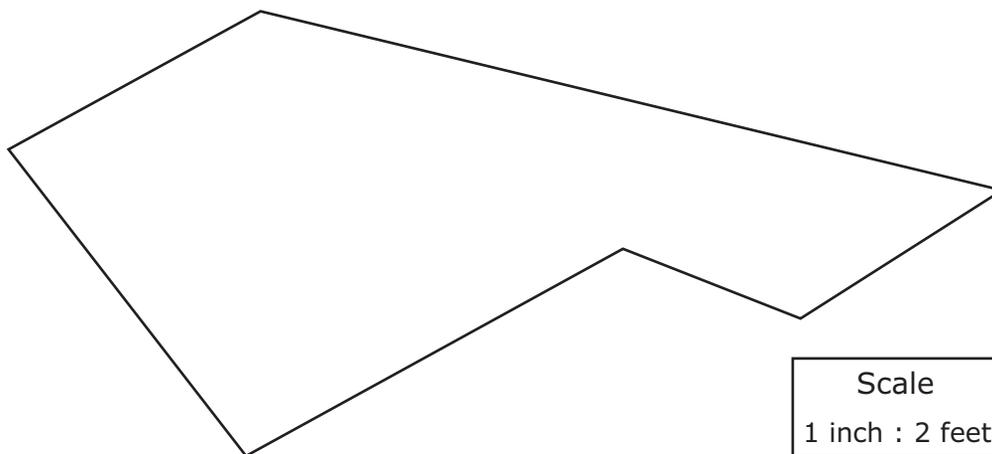
32 At 7:26 A.M., Dante started delivering packages.

- At 10:34 A.M., he delivered the last package.
- He delivered a total of 18 packages.
- He spent about the same amount of time delivering each package.

Which of the following is the best estimate of the number of minutes Dante spent delivering each package?

- F** 10 min
- G** 180 min
- H** 60 min
- J** 20 min

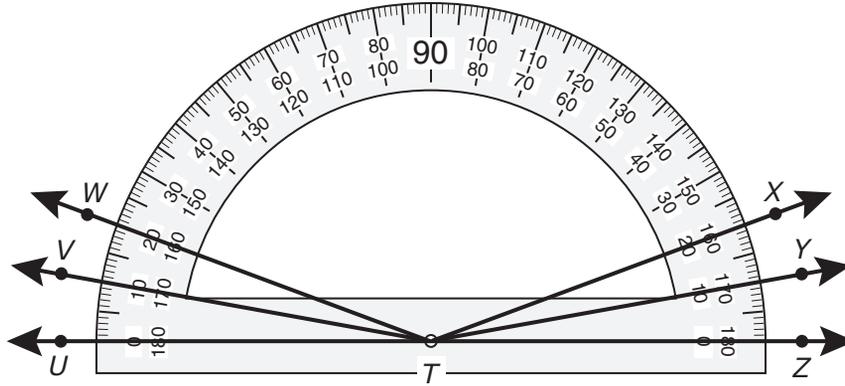
- 33** The figure below is a scale drawing of a design on a gym wall. Use the ruler provided to measure the dimensions of the figure to the nearest $\frac{1}{4}$ inch.



Each inch on the scale drawing represents 2 feet of the actual design on the gym wall. Which of the following is closest to the perimeter of the actual design on the gym wall?

- A** 11 ft
 - B** 24 ft
 - C** 12 ft
 - D** 22 ft
-
- 34** On Saturday, Ricardo drank a total of 40 fluid ounces of water. If he drank m fluid ounces of water that morning, which equation can be used to find n , the number of fluid ounces of water he drank the rest of the day?
- F** $40 - m = n$
 - G** $40 + m = n$
 - H** $40 \div m = n$
 - J** $40 \times m = n$

35 Which angle does NOT appear to have a measure of 160° ?



- A $\angle VTY$
- B $\angle WTZ$
- C $\angle WTY$
- D $\angle UTX$

36 A worker at a clothing company uses 200 buttons to make 50 shirts. At this rate, how many buttons would the worker use to make 350 shirts?

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

37 There is a relationship between the values of p and k in the table below.

p	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$
k	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	1

Which expression represents the value of k in terms of p ?

- A $p + \frac{1}{8}$
- B $p + \frac{1}{16}$
- C $p + \frac{1}{2}$
- D $p + \frac{1}{4}$

38 All the minutes used by Mrs. Larsen and her 3 children for cell phone calls last month were reported on the same bill.

- The bill showed that a total of 1,850 minutes had been used last month.
- Mrs. Larsen used 462 minutes.
- Her son used twice as many minutes as she used.
- Each of her daughters used the same number of minutes.

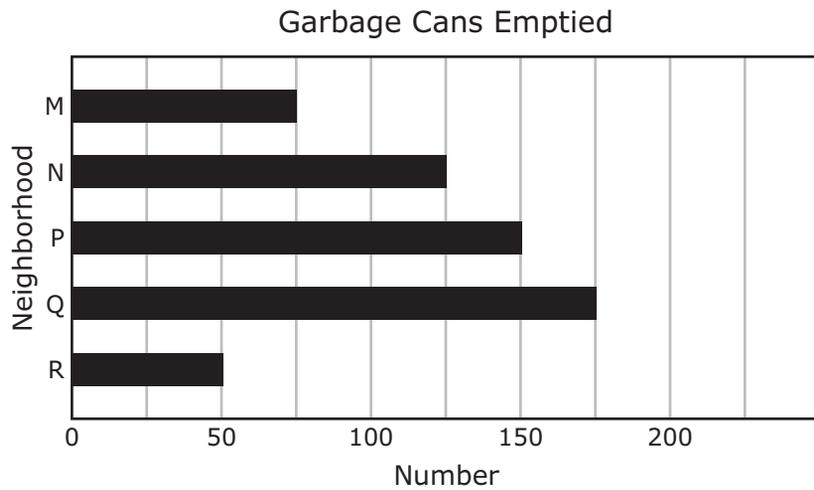
The expression below can be used to find the number of minutes each of Mrs. Larsen's daughters used.

$$(1,850 - 462 - 462 \times 2) \div 2$$

What was the number of minutes each of Mrs. Larsen's daughters used?

- F** 926 min
- G** 1 min
- H** 1,156 min
- J** 232 min

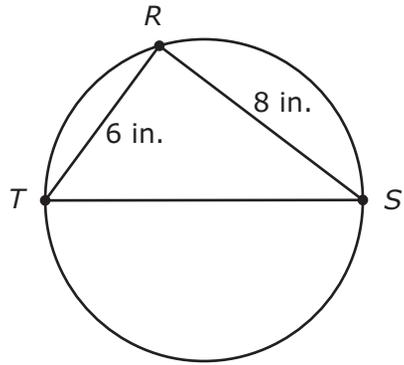
39 The graph below shows the number of garbage cans that were emptied in five neighborhoods.



Which statement is best supported by the information in the graph?

- A** A total of 500 garbage cans were emptied in these 5 neighborhoods.
- B** The combined number of garbage cans emptied in Neighborhood M and Neighborhood N is 50 more than the number of garbage cans emptied in Neighborhood P.
- C** The difference between the greatest number of garbage cans emptied and the least number of garbage cans emptied is 110.
- D** The combined number of garbage cans emptied in Neighborhood P and Neighborhood Q is 375 more than the number of garbage cans emptied in Neighborhood R.

- 40 In the figure below, the vertices of triangle RST are on a circle.



- Line segment TS contains the center of the circle.
- The perimeter of triangle RST is 24 inches.

What is the circle's radius?

- F** 8 inches, because $d = 24 - 8$ and $d \div 2 = r$
- G** 32 inches, because $d = 24 - 8$ and $d \times 2 = r$
- H** 20 inches, because $d = 24 - (8 + 6)$ and $d \times 2 = r$
- J** 5 inches, because $d = 24 - (8 + 6)$ and $d \div 2 = r$

41 Mr. Lee mailed 3 packages. The greatest amount he paid to mail one of these packages was \$3.60. The least amount he paid to mail one of these packages was \$1.70. What could be the total amount Mr. Lee paid to mail the 3 packages?

- A** \$8.30
- B** \$11.50
- C** \$5.10
- D** \$10.80

42 An adult human body contains about 10 pints of blood. How many fluid ounces is the equivalent of 10 pints?

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

- 43 The graph below shows how the prices of two different menu items at a restaurant have changed from Year 1 to Year 7.



If the prices continue to change in this same way, which statement is true?

- A In Year 8, the price of a hamburger will be \$7.00.
- B In Year 9, the price of a chicken sandwich will be \$9.00.
- C In Year 8, the difference between the price of a chicken sandwich and the price of a hamburger will be \$1.00.
- D In Year 9, the price of a chicken sandwich plus the price of a hamburger will be \$16.50.

44 A king snake is $\frac{31}{50}$ m long. What is an equivalent length of this king snake in meters?

F 0.31 m

G $3\frac{1}{50}$ m

H 0.062 m

J Not here

45 Vanessa is making a sauce for a chicken dish. The list below shows the amount of each ingredient she needs in order to make 4 servings of the sauce.

- 2 tablespoons of black pepper
- 1 cup of peanut butter
- 3 tablespoons of vinegar
- 2 tablespoons of soy sauce
- 1 cup of water

Based on this information, which statement is true?

- A** For 16 servings, she would need to use 12 tablespoons of vinegar.
- B** For 20 servings, she would need to use 7 tablespoons of soy sauce.
- C** For 2 servings, she would need to use 4 tablespoons of black pepper.
- D** For 12 servings, she would need to use 9 cups of peanut butter.

- 46** Angie had a bag that contained 14 oranges. She put 3 of the oranges in her brother's lunch box. She put 2 times as many oranges in the refrigerator as she put in her brother's lunch box. She used the rest of the oranges to make orange juice. Based on the expression below, how many oranges did Angie use to make orange juice?

$$14 - (3 + 2 \cdot 3)$$

- F** 8
G 5
H 1
J 9

-
- 47** The circular opening of a tunnel has a circumference of 36 meters. Which equation can be used to find d , the diameter of the tunnel opening in meters?

- A** $\pi \cdot 36 = d$
B $\frac{36}{2\pi} = d$
C $2 \cdot \pi \cdot 36 = d$
D $\frac{36}{\pi} = d$

- 48** The table below shows the number of teeth of each type in Ava's mouth.

Ava's Teeth

Type	Number
Incisor	8
Canine	4
Premolar	8
Molar	12

Ava wants to make a circle graph to represent the information in the table. What percentage of the circle graph should she use to represent the percentage of teeth in her mouth that are incisors?

- F** 25%, because $\frac{8}{32} = \frac{1}{4}$ and $\frac{1}{4} = \frac{25}{100}$
- G** 8%, because $\frac{8}{100} = 8\%$
- H** 24%, because $32 - 8 = 24$
- J** 76%, because $\frac{12 + 8 + 4}{100} = \frac{24}{100}$ and $\frac{100}{100} - \frac{24}{100} = \frac{76}{100}$

-
- 49** Every day a zookeeper feeds 4 adult gorillas a total of 160 lb of food. At this rate, how many pounds of food would the zookeeper need every day to feed 6 adult gorillas?

- A** 40 lb
- B** 320 lb
- C** 240 lb
- D** 80 lb

50 At a movie theater adult tickets cost \$10, and child tickets cost \$6. Which equation can be used to find s , the total number of dollars a family of k adults and 5 children would pay for movie tickets?

F $s = 10k + 6(5)$

G $s = 6k + 10(5)$

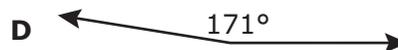
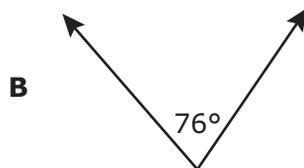
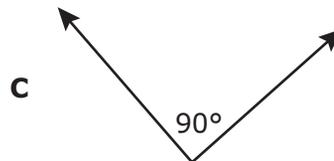
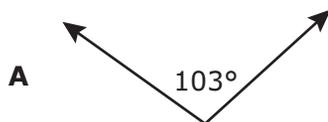
H $s = (10 + 6) \cdot (k + 5)$

J $s = 10k - 6(5)$

51 Danica drew an angle that has the characteristics listed below.

- Its measure is less than 108.5° .
- It is an acute angle.

Which of the following could be the angle Danica drew?



52 At 8:00 A.M., 26 children were at a day care. By 3:00 P.M., 12 of these children were no longer at the day care. Which integer best represents the change in the number of children at the day care from 8:00 A.M. to 3:00 P.M.?

F +26

G +12

H -26

J -12

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



**STAAR
GRADE 6
Mathematics
April 2013**