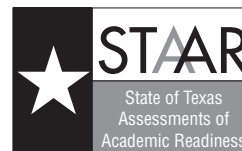


GRADE 7
Mathematics

Administered May 2016

RELEASED

STAAR GRADE 7 MATHEMATICS REFERENCE MATERIALS



LINEAR EQUATIONS

Slope-intercept form

$$y = mx + b$$

Constant of proportionality

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

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

$$A = \pi r^2$$

VOLUME

Prism

$$V = Bh$$

Pyramid

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

ADDITIONAL INFORMATION

Pi

$$\pi \approx 3.14$$

or

$$\pi \approx \frac{22}{7}$$

Distance

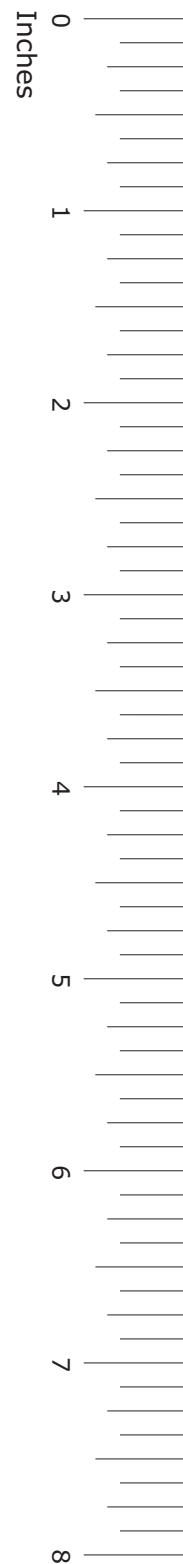
$$d = rt$$

Simple interest

$$I = Prt$$

Compound interest

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



STAAR GRADE 7 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)

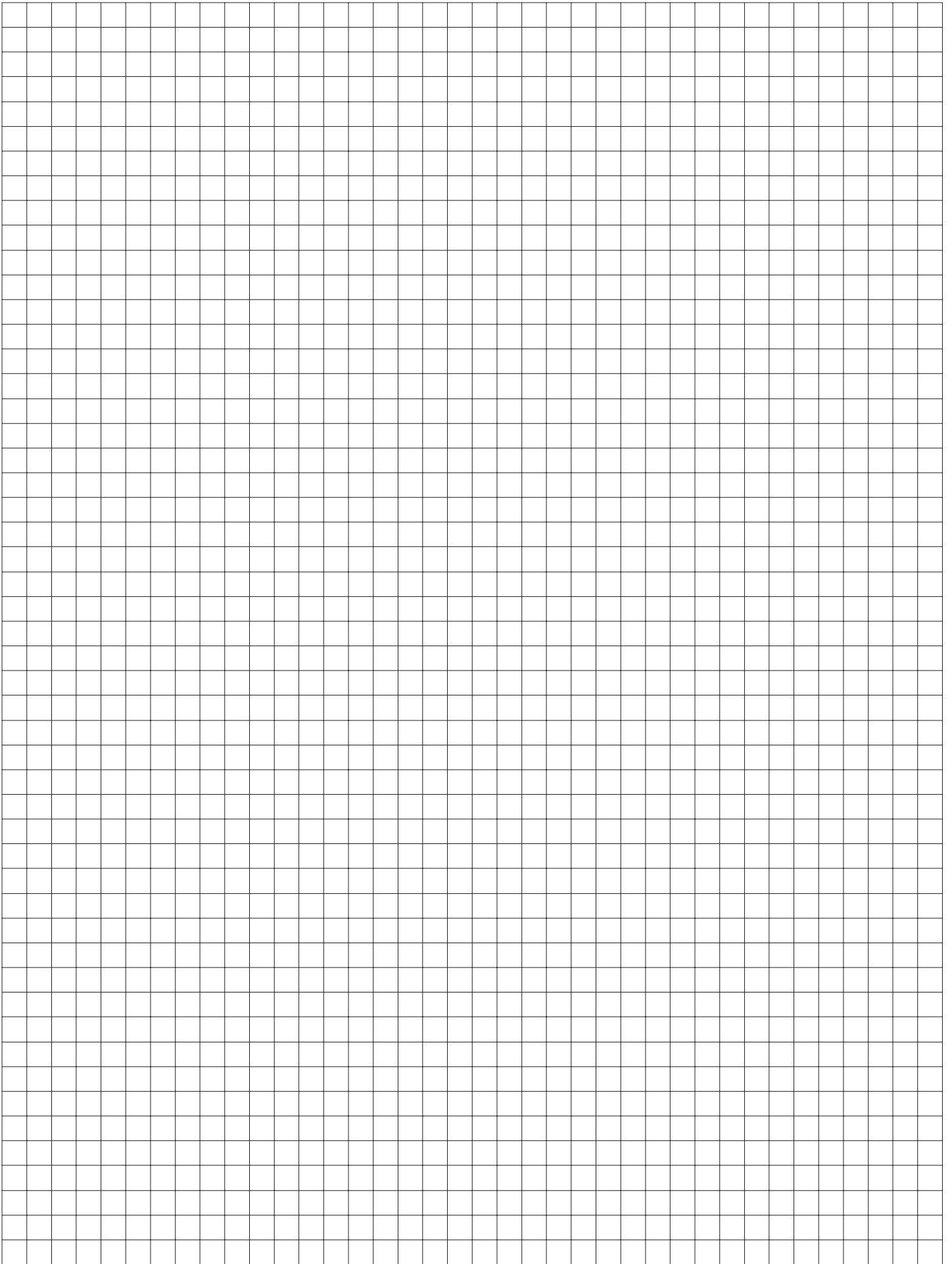
Metric

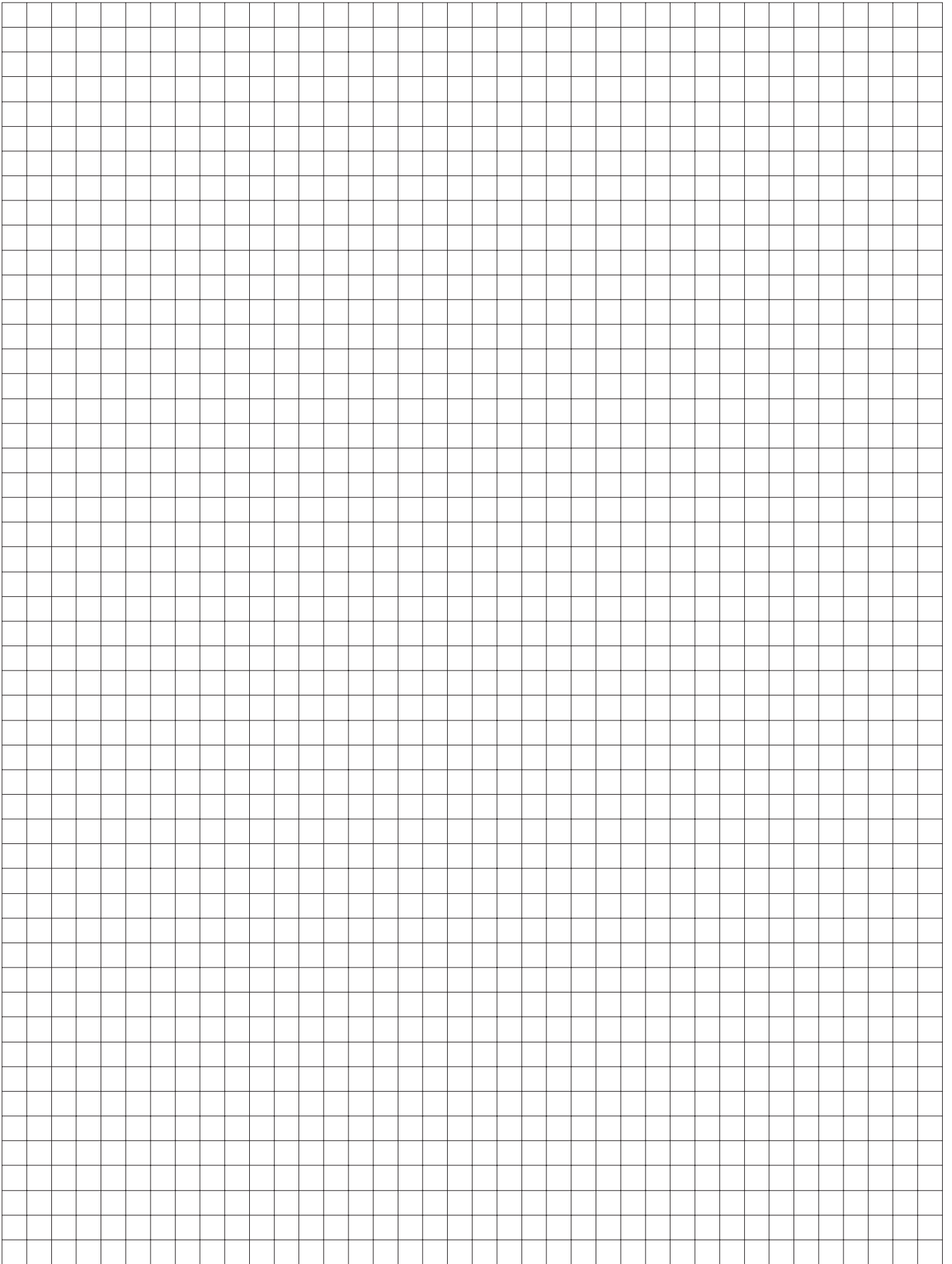
1 kilogram (kg) = 1,000 grams (g)

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

20
19
18
17
16
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12
11
10
9
8
7
6
5
4
3
2
1
0

Centimeters





MATHEMATICS

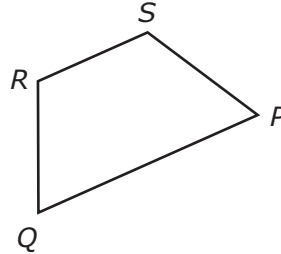
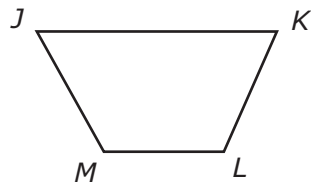
DIRECTIONS

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 Tareq pays \$22.10 for 2.6 pounds of salmon. What is the price per pound of the salmon?

- A \$57.46
 - B \$8.50
 - C \$19.50
 - D \$24.70
-

2 Figure $JKLM$ is similar to figure $PQRS$.



Which proportion must be true for these figures?

- F $\frac{QR}{QP} = \frac{JK}{LM}$
- G $\frac{QR}{KL} = \frac{RS}{JK}$
- H $\frac{QR}{MJ} = \frac{PQ}{LM}$
- J $\frac{QR}{KL} = \frac{PS}{JM}$

3 Bailey will roll a number cube and flip a coin for a probability experiment. The faces of the number cube are labeled 1 through 6. The coin can land on heads or tails. If Bailey rolls the number cube once and flips the coin once, which list contains only the outcomes in which the number cube lands on a number greater than 4?

A 5, Heads
5, Tails
6, Heads
6, Tails

B 5, Heads
6, Tails

C 1, Heads
1, Tails
2, Heads
2, Tails
3, Heads
3, Tails
4, Heads
4, Tails
5, Heads
5, Tails
6, Heads
6, Tails

D 4, Heads
4, Tails
5, Heads
5, Tails
6, Heads
6, Tails

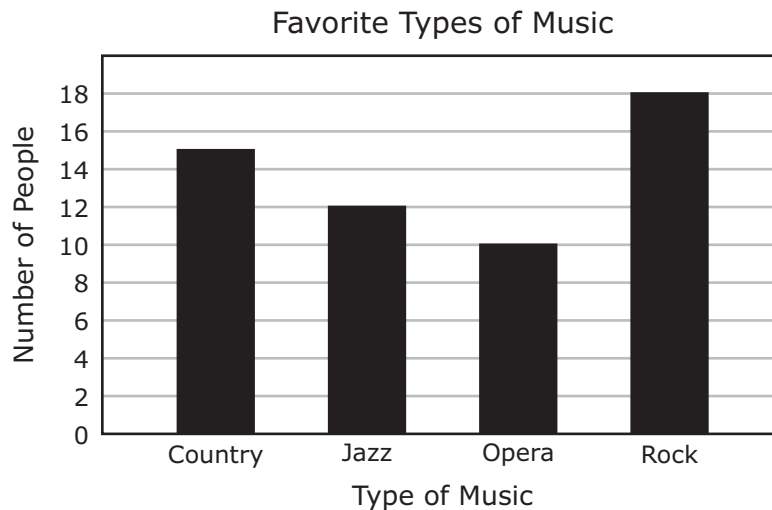
4 An equation is modeled.

$$\begin{array}{|c|} \hline x \\ \hline \end{array} \begin{array}{|c|} \hline x \\ \hline \end{array} \begin{array}{|c|} \hline x \\ \hline \end{array} \begin{array}{|c|} \hline x \\ \hline \end{array} \begin{array}{|c|} \hline x \\ \hline \end{array} \begin{array}{|c|c|} \hline 1 & 1 \\ \hline \end{array} \begin{array}{|c|c|} \hline 1 & 1 \\ \hline \end{array} \begin{array}{|c|c|} \hline 1 & 1 \\ \hline \end{array} = \begin{array}{|c|} \hline 1 \\ \hline \end{array}$$

What value of x makes the equation true?

- F 1
- G 7
- H -5
- J -1

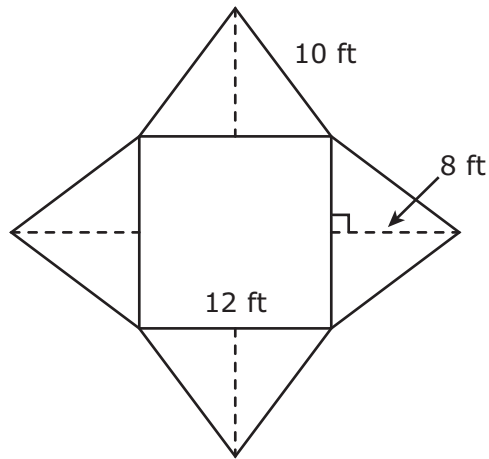
5 Maribel surveyed 55 people to find out their favorite types of music. The results are shown in the bar graph.



Based on the information in the graph, which types of music were chosen by 40% of the people surveyed?

- A Country and opera
- B Jazz and opera
- C Jazz, opera, and rock
- D Country, jazz, and rock

- 6 The net of a square pyramid and its dimensions are shown in the diagram.



What is the total surface area of the pyramid in square feet?

- F** 336 ft²
G 960 ft²
H 204 ft²
J 624 ft²
-
- 7 Rita has a loan of \$45,580. This loan has a simple interest rate of 4% per year. What is the amount of interest that Rita will be charged on this loan at the end of one year?
- A** \$47,403.20
B \$11,395
C \$18,232
D \$1,823.20

- 8** Ms. Blankenship had \$80 to purchase school supplies for her class. She bought 32 glue sticks and 32 boxes of crayons. Each glue stick cost \$1.40, and each box of crayons cost \$0.59. How much money did Ms. Blankenship have left after these purchases?
- F** \$16.32
 - G** \$18.88
 - H** \$63.68
 - J** \$35.20
-

- 9** A group of students stood in a circle to play a game. The circle had a diameter of 22 meters. Which measurement is closest to the circumference of the circle in meters?
- A** 34.54 m
 - B** 1,519.76 m
 - C** 379.94 m
 - D** 69.08 m

10 Gabriel has these cans of soup in his kitchen cabinet.

- 2 cans of tomato soup
- 3 cans of chicken soup
- 2 cans of cheese soup
- 2 cans of potato soup
- 1 can of beef soup

Gabriel will randomly choose one can of soup. Then he will put it back and randomly choose another can of soup. What is the probability that he will choose a can of tomato soup and then a can of cheese soup?

F $\frac{2}{5}$

G $\frac{2}{45}$

H $\frac{1}{25}$

J $\frac{1}{5}$

- 11 A dolphin travels through the water at a speed of 25 kilometers per hour. Which representation shows the distance a dolphin can travel at this rate?

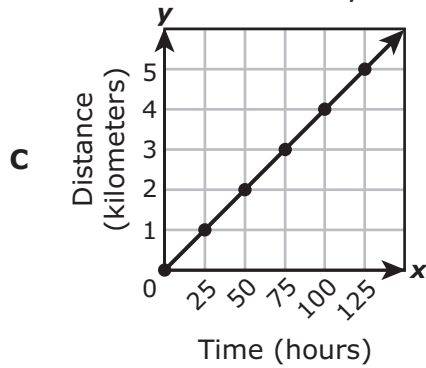
Distance Traveled by a Dolphin

A

| Time (hours) | Distance (kilometers) |
|--------------|-----------------------|
| 0 | 0 |
| 2 | 50 |
| 4 | 100 |
| 6 | 150 |
| 8 | 200 |

- B** $y = x + 25$, where x represents the time in hours and y represents the distance in kilometers

Distance Traveled by a Dolphin



- D** In 5 hours a dolphin can travel a distance of 135 kilometers.

12 Leo wants to buy some shoes. He found the shoes at three different stores for a price of \$35. The stores are each having a sale.

- Store X is offering 15% off the price of the shoes.
- Store Y is offering \$5 off the price of the shoes.
- Store Z is offering a $\frac{1}{5}$ discount off the price of the shoes.

Which statement about the sale price of these shoes is true?

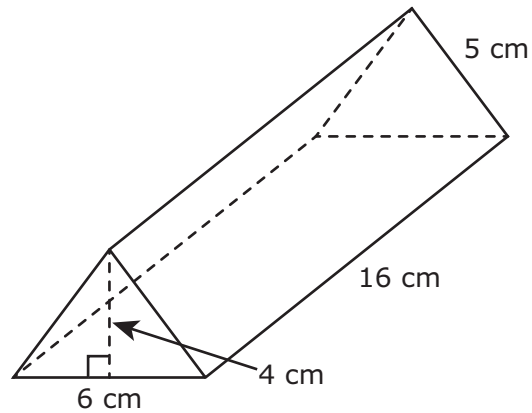
- F** Store X has the best sale price of \$20.
 - G** Store Z has the best sale price of \$28.
 - H** Store Y has the best sale price of \$30.
 - J** Store Z has the best sale price of \$7.
-

13 Which situation is best represented by the following equation?

$$45w + 123.95 = 753.95$$

- A** Erica paid \$753.95 for dance classes. She paid a \$123.95 registration fee and \$45 for each week she was enrolled in the classes. What is w , the number of weeks Erica was enrolled in dance classes?
- B** Erica paid \$753.95 for dance classes. She paid a \$45 registration fee and \$123.95 for each week she was enrolled in the classes. What is w , the number of weeks Erica was enrolled in dance classes?
- C** Erica and her sister paid \$753.95 for dance classes. Erica paid \$123.95 for each week she was enrolled in the classes, and her sister paid \$45 for each week she was enrolled in the classes. What is w , the number of weeks Erica and her sister were enrolled in dance classes?
- D** Erica paid \$753.95 for dance classes. She paid \$123.95 for each week she was enrolled in the classes after using a coupon that gave her \$45 off the price per week. What is w , the number of weeks Erica was enrolled in dance classes?

14 The dimensions of a triangular prism are shown in the diagram.



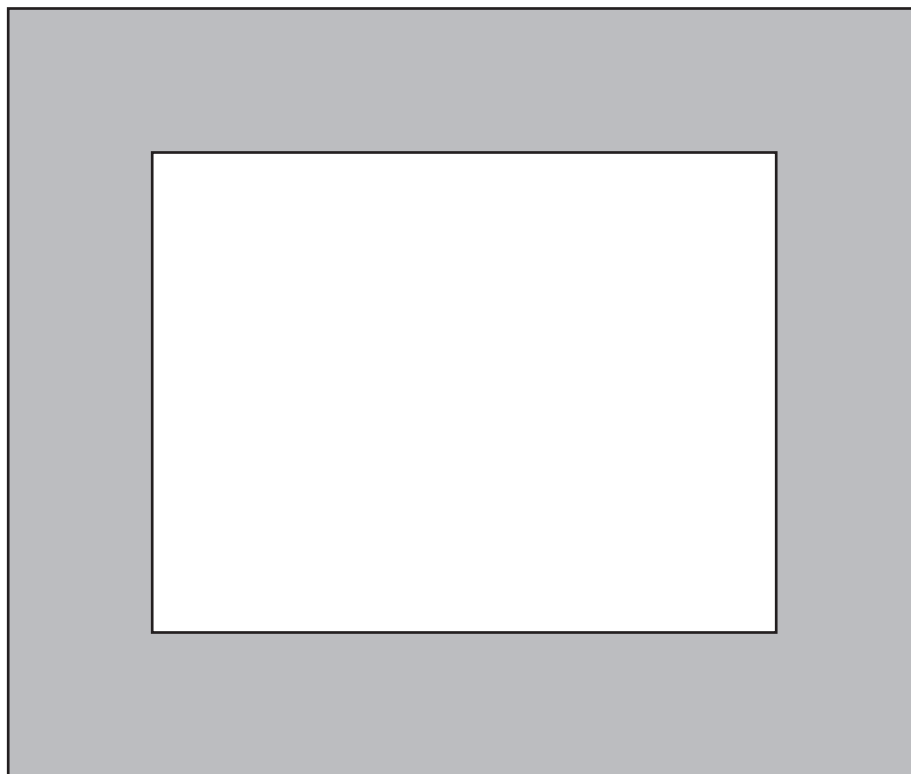
What is the volume of the triangular prism in cubic centimeters?

- F 480 cm^3
- G 192 cm^3
- H 240 cm^3
- J 384 cm^3

15 Yvette uses 6 grams of tea leaves to make 24 fluid ounces of tea. Last week she made 288 fluid ounces of tea. How many grams of tea leaves did Yvette use to make tea last week?

- A 0.5 g
- B 1,152 g
- C 72 g
- D 2 g

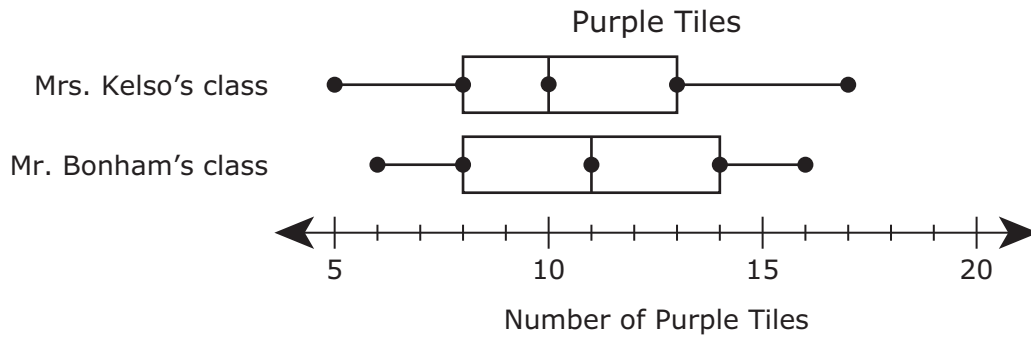
- 16** Two rectangles were used to form the following figure. Use the ruler provided to measure the dimensions of the figure to the nearest quarter of an inch.



Which measurement is closest to the area of the shaded region of this figure in square inches?

- F** 19 in.²
- G** 11 in.²
- H** 6 in.²
- J** 8 in.²

- 17** Mrs. Kelso and Mr. Bonham gave each of their students a small bag of colored tiles. The students each counted the number of purple tiles they received. The box plots display the data for both classes.



Which statement is best supported by the information in the box plots?

- A** The range of the data for Mr. Bonham's class is less than the range of the data for Mrs. Kelso's class.
 - B** The data for Mrs. Kelso's class are more symmetrical than the data for Mr. Bonham's class.
 - C** The median number of the data for Mr. Bonham's class is less than the median number of the data for Mrs. Kelso's class.
 - D** The interquartile range of the data for Mrs. Kelso's class is greater than the interquartile range of the data for Mr. Bonham's class.
-
- 18** Corbin made a scale model of the San Jacinto Monument. The monument has an actual height of 604 feet. Corbin's model used a scale in which 1 inch represents 100 feet. What is the height in inches of Corbin's model?

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

19 An isosceles triangle has base angles that each measure 42° . Which equation can be used to find z , the measure of the third angle of this isosceles triangle in degrees?

A $84 + 2z = 180$

B $84 + z = 180$

C $42 + 2z = 180$

D $42 + z = 180$

20 Walter and Brian each have a CD collection.

- The number of CDs in Walter's collection can be represented by x .
- The number of CDs in Brian's collection is 3 times the number in Walter's collection.
- The total number of CDs in both collections is 144.

What is x , the number of CDs in Walter's collection?

F 108

G 48

H 72

J 36

21 A music club has 15 members. Each member pays monthly dues of \$14.60. On the first day of the month, 8 members paid their dues. The remaining members paid their dues on the second day of the month. How much money was collected in dues on the second day of the month?

A \$335.80

B \$102.20

C \$116.80

D \$219.00

- 22** A store manager receives a delivery of 2 boxes of lightbulbs. Each box contains 25 lightbulbs. The store manager tests all the lightbulbs and finds that 2 of them are defective. Based on these results, what can the store manager predict about the next delivery of lightbulbs?
- F** A delivery of 3 boxes will contain 3 more defective lightbulbs than a delivery of 2 boxes.
 - G** A delivery of 4 boxes will contain 2 more defective lightbulbs than a delivery of 2 boxes.
 - H** A delivery of 5 boxes will contain 10 more defective lightbulbs than a delivery of 2 boxes.
 - J** A delivery of 6 boxes will contain 3 more defective lightbulbs than a delivery of 2 boxes.
-

23 If $x = -6$, which inequality is true?

- A** $-5 - 3x > 10$
 - B** $-3 - 5x < -14$
 - C** $1 - 2x > 13$
 - D** $2 - x < -3$
-

24 Chloe is 5 feet 4 inches tall. There are 2.54 centimeters in 1 inch. What is Chloe's height in centimeters?

- F** 56.54 cm
- G** 13.72 cm
- H** 162.56 cm
- J** 152.40 cm

25 The diameter of the handle of a softball bat is $1\frac{3}{4}$ inches. What is the length in inches of the diameters of 8 of these bat handles?

- A** 6 in.
 - B** $8\frac{3}{4}$ in.
 - C** $9\frac{3}{4}$ in.
 - D** 14 in.
-

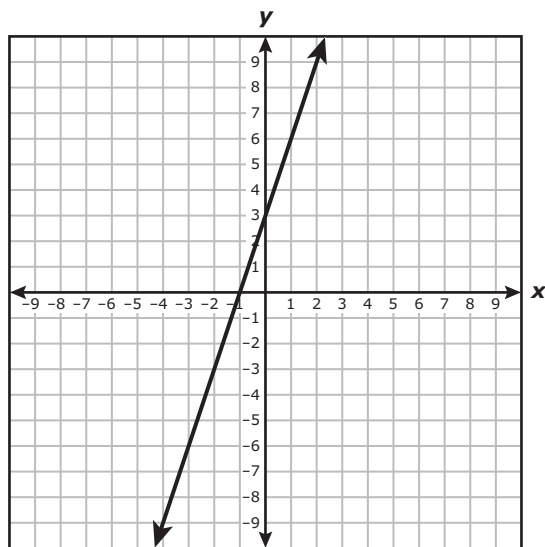
26 A bag contains:

- 5 red marbles
- 6 blue marbles
- 3 green marbles
- 4 black marbles
- 2 yellow marbles

A marble will be drawn from the bag and replaced 100 times. What is a reasonable prediction for the number of times a green or black marble will be drawn?

- F** 14
- G** 65
- H** 7
- J** 35

27 Which equation best represents the relationship between x and y in the graph?



- A $y = 3x + 3$
- B $y = 3x - 1$
- C $y = \frac{1}{3}x + 3$
- D $y = \frac{1}{3}x - 1$

28 Emily created the net worth statement shown.

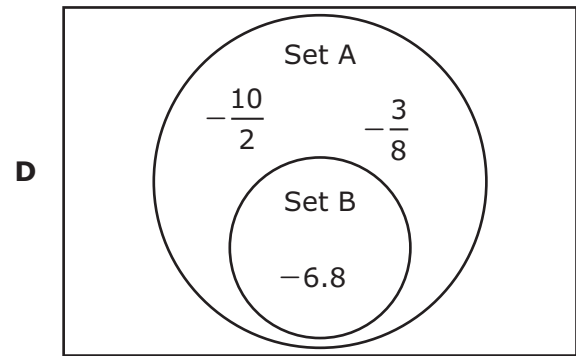
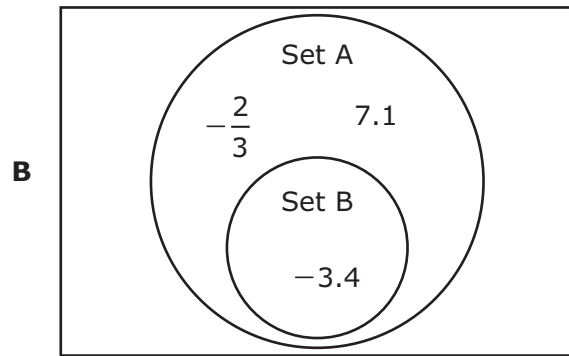
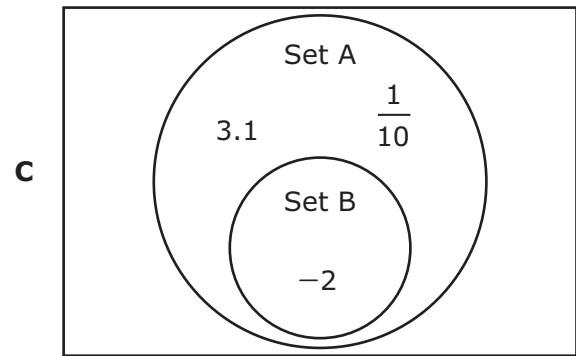
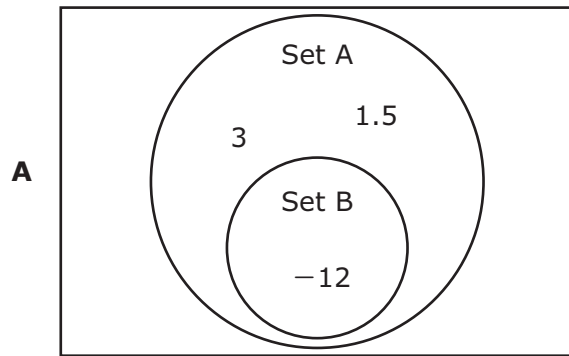
Net Worth Statement

| Assets | |
|----------------------------|------------------|
| Checking account | \$750 |
| Automobile (current value) | \$8,950 |
| House (current value) | \$92,500 |
| Savings account | \$1,350 |
| Investments | \$4,000 |
| Total Assets | \$107,550 |
| Liabilities | |
| Credit card debt | \$3,800 |
| Student loans | \$15,750 |
| Personal loans | \$975 |
| Total Liabilities | \$20,525 |

Based on the information in the table, what is Emily's net worth?

- F \$107,550
- G \$87,025
- H \$20,525
- J \$128,075

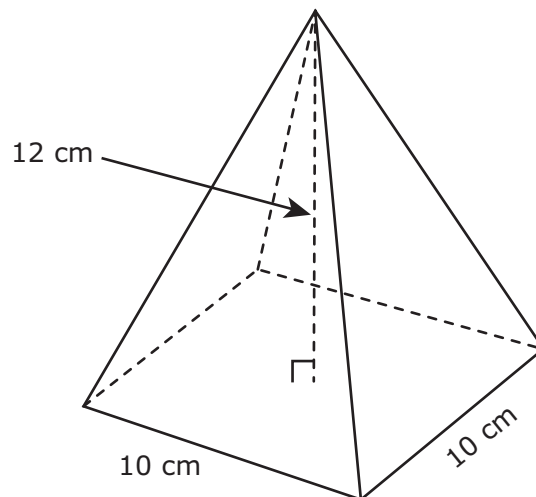
- 29 Set A represents rational numbers. Set B represents integers. Which diagram shows the numbers placed in the correct sets?



-
- 30 A boat traveled 27 miles in 2 hours. At this rate, how many miles will the boat travel in $\frac{1}{2}$ hour?

- F** $13\frac{1}{2}$ mi
- G** $6\frac{3}{4}$ mi
- H** $3\frac{3}{8}$ mi
- J** $24\frac{1}{2}$ mi

- 31** Alina drew a model of a square pyramid. The dimensions of the model are shown in the diagram.



What is the volume of Alina's model in cubic centimeters?

- A** 400 cm^3
B $1,200 \text{ cm}^3$
C 600 cm^3
D 160 cm^3
-
- 32** At an assembly 7 out of the first 10 students who entered the gym were carrying a backpack. Based on this information, if 700 students were at the assembly, how many students could be expected to be carrying a backpack?

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

- 33** A circular railroad-crossing sign has a diameter of 30 inches.



Which measurement is closest to the area of the sign in square inches?

- A** 94.2 in.²
- B** 188.4 in.²
- C** 706.5 in.²
- D** 286.6 in.²

- 34 Caroline's cell phone plan costs \$32 per month. Which table shows the sum of the amounts that Caroline will pay for her cell phone plan over the next 4 months?

Caroline's Cell Phone Plan

F

| Month | 1 | 2 | 3 | 4 |
|-------------------|-----|------|------|------|
| Total Amount Paid | \$0 | \$32 | \$64 | \$96 |

Caroline's Cell Phone Plan

G

| Month | 1 | 2 | 3 | 4 |
|-------------------|-----|------|------|------|
| Total Amount Paid | \$8 | \$16 | \$24 | \$32 |

Caroline's Cell Phone Plan

H

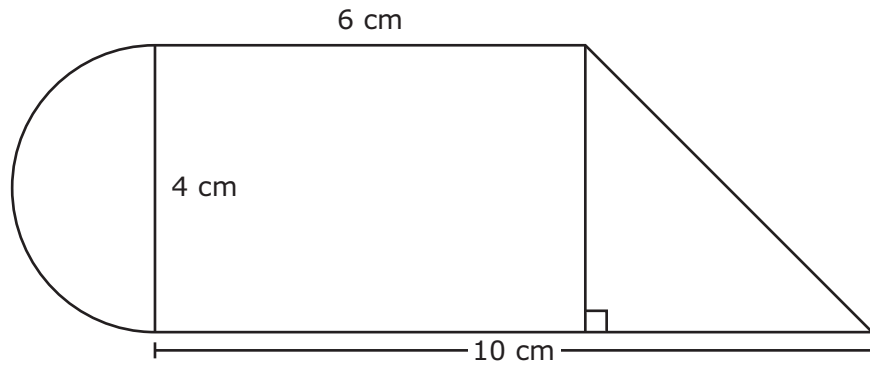
| Month | 1 | 2 | 3 | 4 |
|-------------------|------|------|------|------|
| Total Amount Paid | \$32 | \$36 | \$40 | \$44 |

Caroline's Cell Phone Plan

J

| Month | 1 | 2 | 3 | 4 |
|-------------------|------|------|------|-------|
| Total Amount Paid | \$32 | \$64 | \$96 | \$128 |

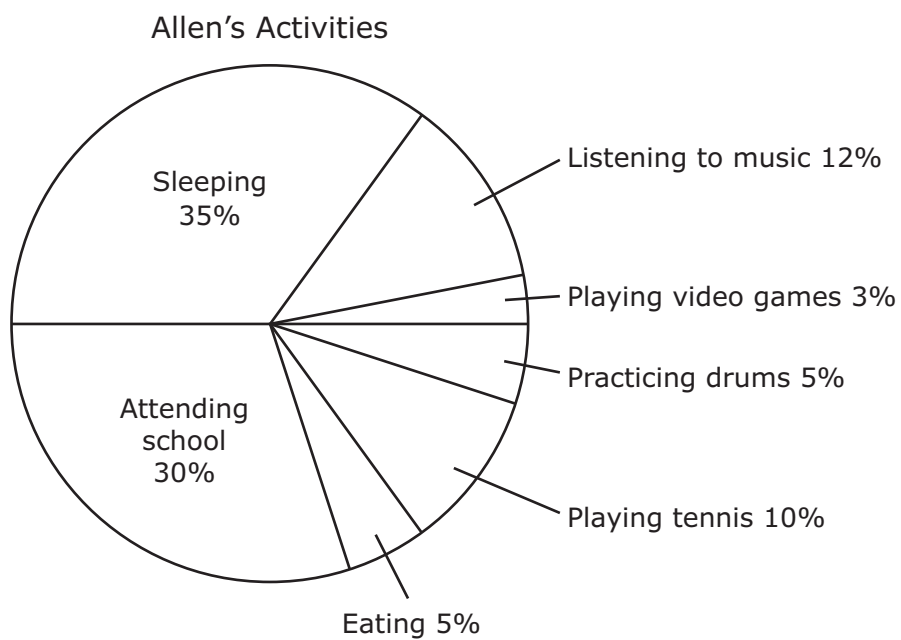
35 Landon used a semicircle, a rectangle, and a right triangle to form the figure shown.



Which is the best estimate of the area of the figure in square centimeters?

- A 52 cm²
- B 44 cm²
- C 26 cm²
- D 38 cm²

36 The circle graph shows Allen's activities during 24 hours.



How much more time in hours did Allen spend listening to music than playing tennis?

- F 2.88 hours
- G 0.48 hour
- H 2.40 hours
- J 0.12 hour

37 There are 40 houses in a neighborhood.

- Company X provides electricity to $\frac{1}{8}$ of the houses.
- Company Y provides electricity to $\frac{2}{5}$ of the houses.
- Company Z provides electricity to the remaining houses.

In this neighborhood, Company Z provides electricity to —

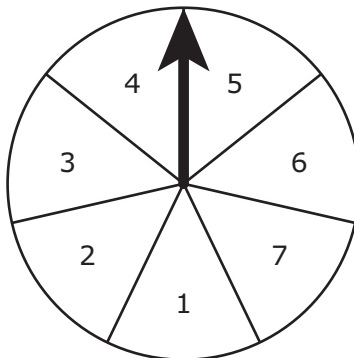
- A** 21 houses
 - B** 24 houses
 - C** 16 houses
 - D** 19 houses
-

38 A refrigerator is priced at \$525.50. There is a 6% sales tax rate. What is the sales tax for the refrigerator in dollars and cents?

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

- 39 A storage container is shaped like a rectangular prism. The volume of the container is 1,360 cubic feet. The area of the base of the container is 160 square feet. What is the height of the container in feet?
- A 17 ft
B 34 ft
C 8.5 ft
D Not here
-

- 40 The spinner shown is divided into congruent sections that are labeled from 1 through 7.



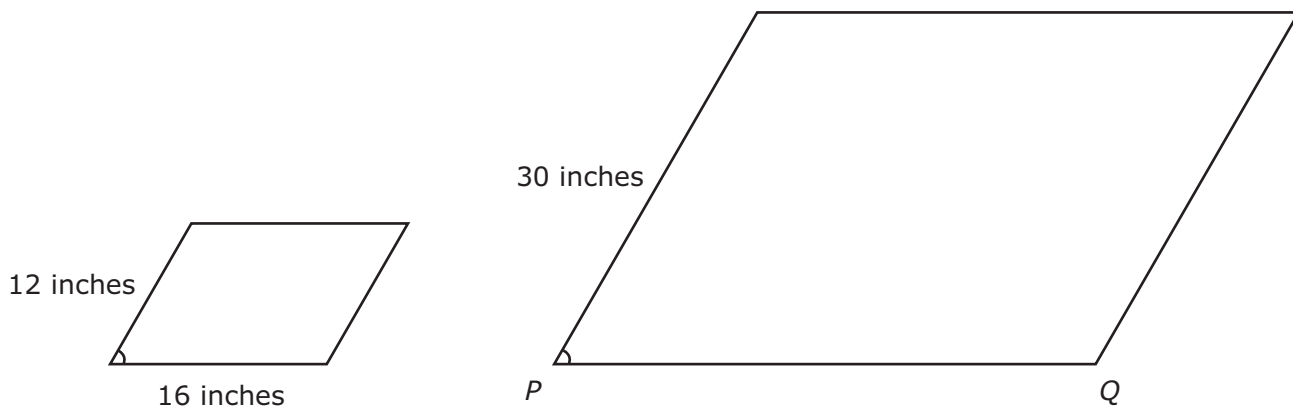
If the spinner is spun one time, what is the probability of the arrow **not** landing on a section labeled with an odd number?

- F $\frac{4}{7}$
G $\frac{3}{4}$
H $\frac{1}{4}$
J $\frac{3}{7}$

41 A store sells new video games for \$55 each. Used video games sell for \$12 each. Jacob is buying 3 new video games and x used video games. Which equation can be used to find y , the total price Jacob must pay in dollars?

- A** $y = 12x + 55$
- B** $y = 12x + 165$
- C** $y = 55x + 12$
- D** $y = 165x + 12$

42 The two parallelograms below are similar.



What is the length in inches of \overline{PQ} ?

- F** 40 in.
- G** 34 in.
- H** 38 in.
- J** 14 in.

43 Felicia earns \$800 a month. The table shows her monthly budget.

Monthly Budget

| Expense | Amount of Money |
|-----------------|-----------------|
| College savings | \$200 |
| Car payment | \$275 |
| Cell phone | \$125 |
| Clothes | \$50 |
| Food | \$100 |
| Other | \$50 |

Which statement is supported by the information in the table?

- A Felicia spends 10% of her monthly budget on clothes and food.
 - B Felicia spends 25% of her monthly budget on her car payment.
 - C Felicia spends 20% of her monthly budget on college savings.
 - D Felicia spends 50% of her monthly budget on her car payment and cell phone.
-

44 What is the value of x in this equation?

$$2x + 2 = -52$$

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

- 45** Felix has a bucket of golf balls. The table shows the number of golf balls of each color in the bucket.

Golf Balls in a Bucket

| Color | Number |
|--------|--------|
| Pink | 4 |
| White | 11 |
| Orange | 8 |
| Green | 18 |

Felix selects a golf ball at random. Based on the information in the table, which statement is true?

- A** The golf ball is more likely to be green than all other colors combined.
 - B** The golf ball is equally likely to be pink, white, orange, or green.
 - C** The golf ball is 2 times as likely to be orange as it is to be pink.
 - D** The golf ball is 7 times as likely to be green as it is to be white.
-
- 46** Jennifer painted a tabletop that is shaped like a circle. The circumference of the tabletop is 6π feet. Which measurement is closest to the area of the tabletop in square feet?
- F** 18.84 ft^2
 - G** 28.26 ft^2
 - H** 37.68 ft^2
 - J** 113.04 ft^2

47 Which table contains only values that satisfy the equation $y = 0.5x + 14$?

A

| x | y |
|----|-----|
| 0 | 0 |
| 5 | 35 |
| 10 | 70 |
| 15 | 105 |
| 20 | 140 |

C

| x | y |
|----|------|
| 0 | 14 |
| 5 | 16.5 |
| 10 | 19 |
| 15 | 21.5 |
| 20 | 24 |

B

| x | y |
|----|-----|
| 0 | 14 |
| 5 | 39 |
| 10 | 64 |
| 15 | 89 |
| 20 | 114 |

D

| x | y |
|----|------|
| 0 | 14 |
| 5 | 14.5 |
| 10 | 15 |
| 15 | 15.5 |
| 20 | 16 |

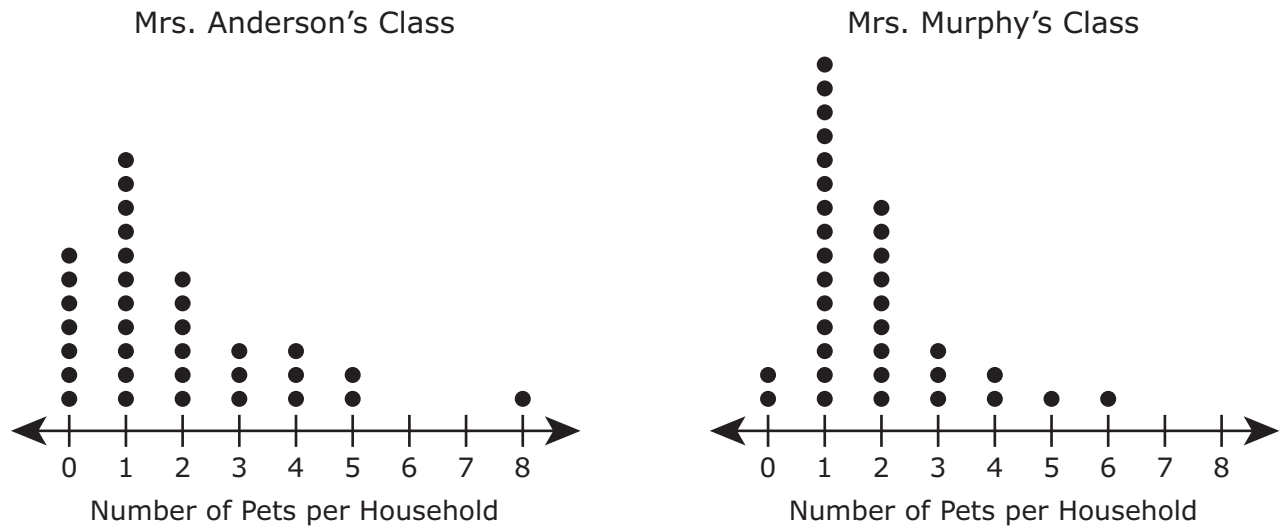
48 The price of a television was reduced from \$250 to \$200. By what percentage was the price of the television reduced?

- F 20%
- G 25%
- H 80%
- J 50%

- 49** Ana drew a map of the Panama Canal. In the scale Ana used for the map, 4 centimeters represents 20 kilometers. The actual length of the Panama Canal is 82 kilometers. What is the length in centimeters of the Panama Canal on Ana's map?
- A** 410 cm
 - B** 15.5 cm
 - C** 16.4 cm
 - D** 162 cm

-
- 50** Jeff bought a bottle of water for \$2. He also bought some hot dogs for \$3 each. Jeff did not spend more than \$14 on the hot dogs and the bottle of water. Which inequality can be used to find h , the number of hot dogs that Jeff could have bought?
- F** $3h - 2 \leq 14$
 - G** $3h + 2 \leq 14$
 - H** $3h - 2 \geq 14$
 - J** $3h + 2 \geq 14$

- 51 The number of pets per household for Mrs. Anderson's class and Mrs. Murphy's class are shown in the dot plots.



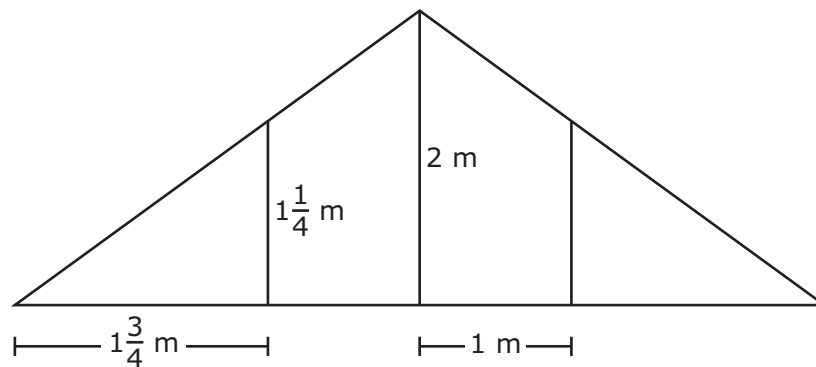
Here are three statements about the number of pets per household for these two classes.

- I. The range of the number of pets per household for Mrs. Murphy's class is greater than the range of the number of pets per household for Mrs. Anderson's class.
- II. The distribution of the data is approximately symmetrical in both sets of data.
- III. The mode of the number of pets per household for Mrs. Anderson's class is equal to the mode of the number of pets per household for Mrs. Murphy's class.

Which of these three statements appear to be true?

- A** I only
- B** I and III
- C** II and III
- D** III only

- 52 An advertising banner has four sections, as modeled below. Two sections are congruent trapezoids, and two sections are congruent right triangles.



Which measurement is the best estimate of the area of the banner in square meters?

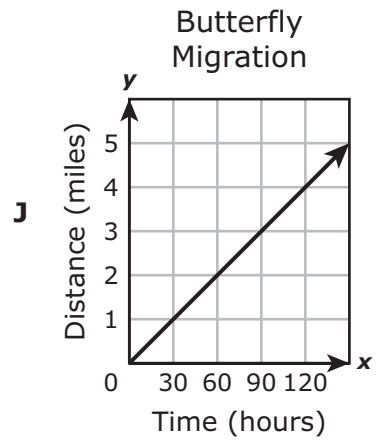
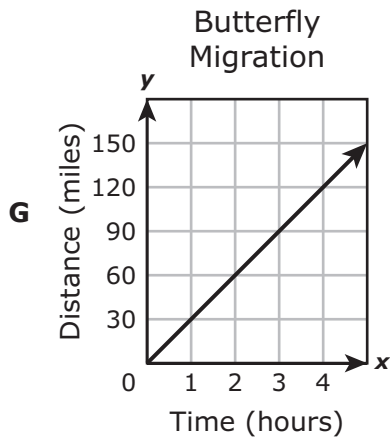
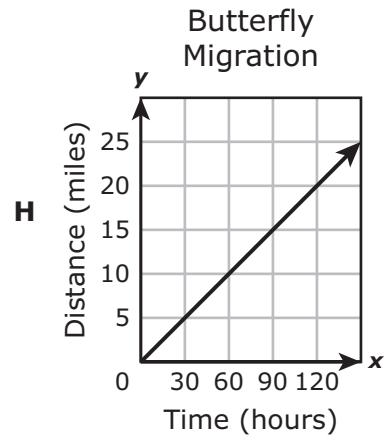
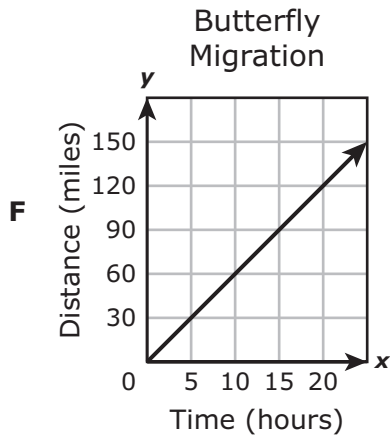
- F 6 m^2
G 15 m^2
H 8 m^2
J 10 m^2
-
- 53 On Roberto's shelf are:

- 6 mystery books
- 5 science books
- 4 history books
- 3 adventure books

Roberto will randomly choose 1 book to read. What is the probability that he will choose an adventure book?

- A $\frac{1}{3}$
B $\frac{1}{18}$
C $\frac{1}{5}$
D $\frac{1}{6}$

- 54 During migration, a butterfly can travel 30 miles in 1 hour. Which graph best represents y , the number of miles a butterfly can travel in x hours?



**STAAR
GRADE 7
Mathematics
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