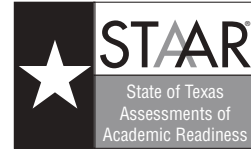


**GRADE 4**  
**Mathematics**

**Administered May 2019**

**RELEASED**

# STAAR GRADE 4 MATHEMATICS REFERENCE MATERIALS



## PERIMETER

Square

$$P = 4s$$

Rectangle

$$P = l + w + l + w$$

or

$$P = 2l + 2w$$

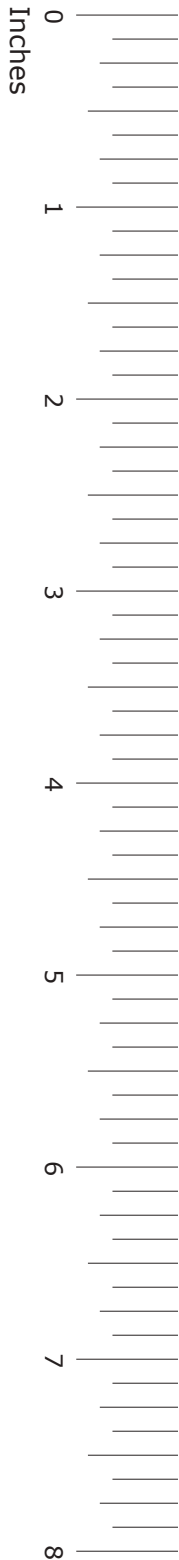
## AREA

Square

$$A = s \times s$$

Rectangle

$$A = l \times w$$



# STAAR GRADE 4 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

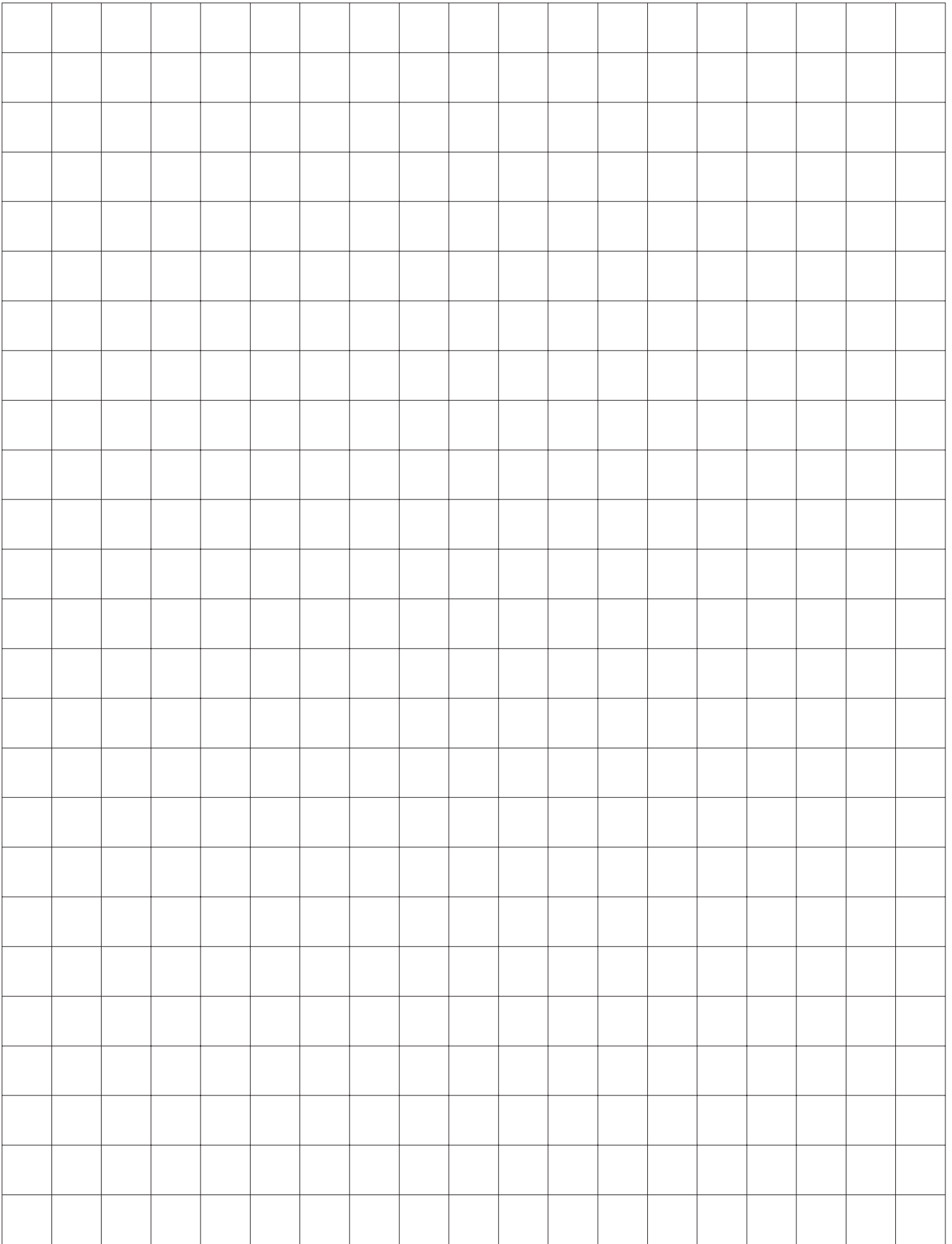
1 week = 7 days

1 day = 24 hours

1 hour = 60 minutes

1 minute = 60 seconds





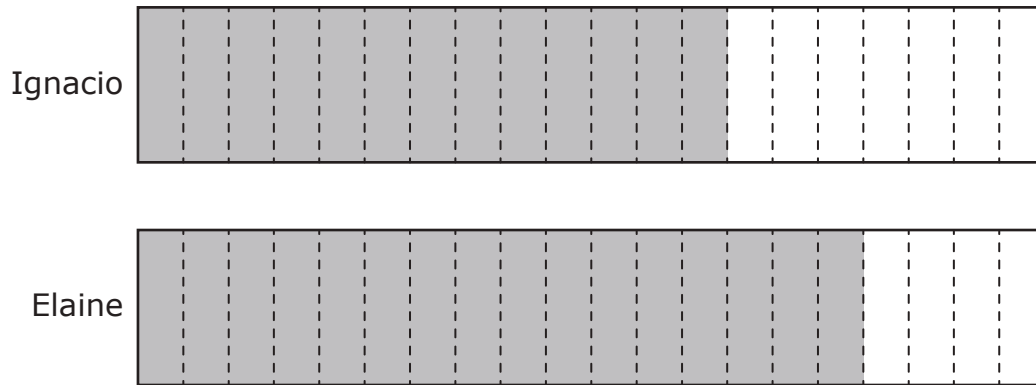
# MATHEMATICS

## 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 People in the United States drink about 129,600,000 bottles of water each day. What is the value of the digit 1 in this number?
- A 100,000,000
  - B 100
  - C 1,000
  - D 100,000

- 2 Ignacio and Elaine read the same book. The shaded part of each model represents the fraction of the book that each student read.



Which expression can be used to find the difference between the fraction of the book Elaine read and the fraction of the book Ignacio read?

- F**  $\frac{16}{4} - \frac{13}{7}$
- G**  $\frac{7}{13} - \frac{4}{16}$
- H**  $\frac{16}{20} - \frac{13}{20}$
- J**  $\frac{20}{16} - \frac{20}{13}$

- 
- 3 Which decimal is equivalent to  $\frac{79}{100}$ ?

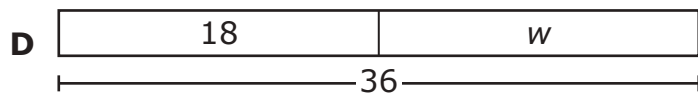
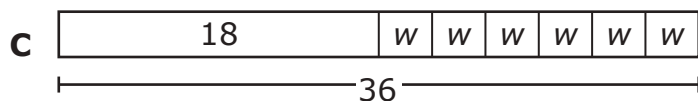
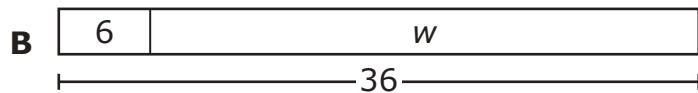
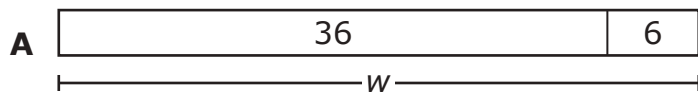
- A** 0.079
- B** 0.79
- C** 7.9
- D** 79.100



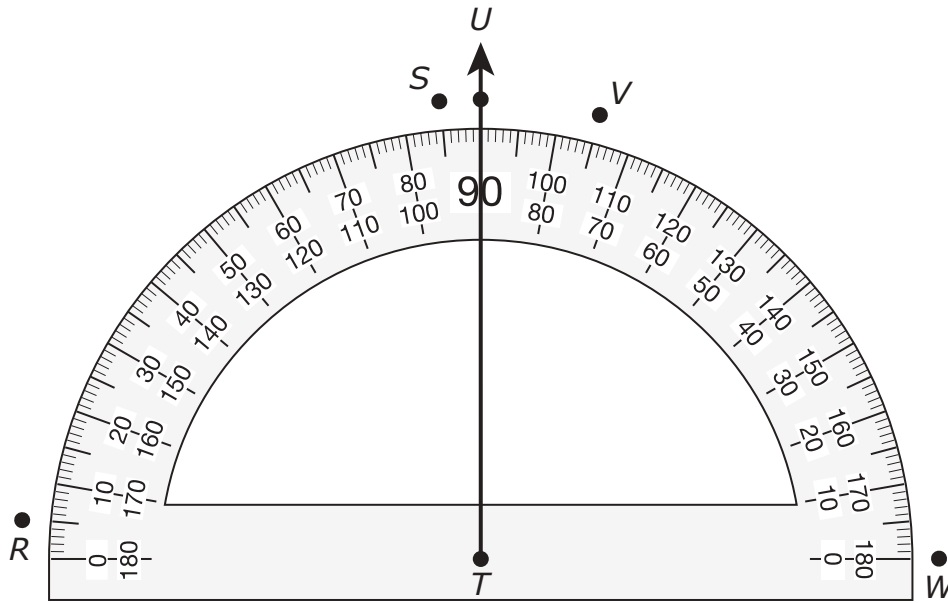
- 4 Which statement best describes a primary service of a bank?
- F Banks offer checking and savings accounts to their customers.
  - G Banks help customers decide which expenses to pay.
  - H Banks help customers meet their neighbors.
  - J Banks sell stamps and deliver mail.
- 

- 5 Alexa had a total of 36 bottles of water. She drank half of the bottles of water last week. Alexa will drink the remaining water bottles during the next 6 days. She will drink the same number of bottles each day.

Which strip diagram shows a way to find  $w$ , the number of water bottles Alexa will drink during each of the next 6 days?



6 Ray  $TU$  has been drawn on the protractor, as shown.



To construct an angle that has a measure of  $85^\circ$ , another ray can be drawn that starts at point  $T$  and passes through —

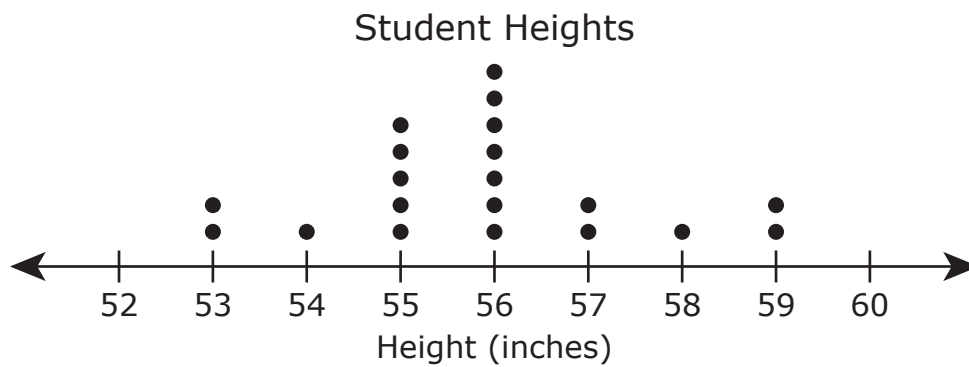
- F** point  $R$
- G** point  $S$
- H** point  $V$
- J** point  $W$

7 The table shows the heights in inches of the students in Mr. Garrison's class.

Student Heights

Height (inches)	Number of Students
53	
54	
55	<del>    </del>
56	<del>    </del>
57	
58	
59	

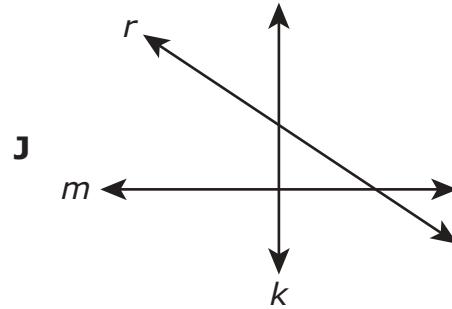
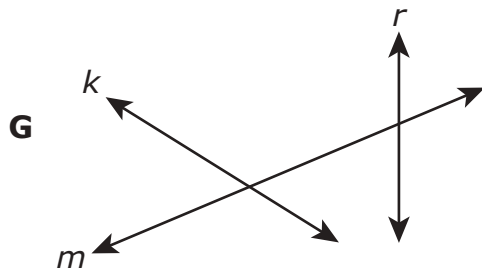
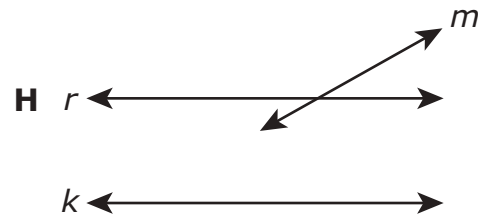
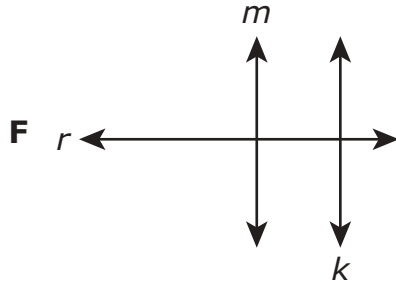
Mr. Garrison made this dot plot to show the heights of his students. The dot plot is incomplete.



What height in inches is missing a data point on the dot plot?

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

8 In which drawing does line  $m$  appear to be perpendicular to line  $k$ ?



---

9 Ms. Thompson needs  $\frac{15}{2}$  yards of red fabric and  $7\frac{1}{2}$  yards of silver fabric. Which comparison is true?

**A**  $\frac{15}{2} > 7\frac{1}{2}$

**B**  $\frac{15}{2} = 7\frac{1}{2}$

**C**  $\frac{15}{2} < 7\frac{1}{2}$

**D** None of these

- 10** Ms. Wilmeth bought 4 bags of candies. Each bag contained 8 candies. She put an equal number of these candies into each of 9 gift boxes.

How many candies were left over?

- F** 3
  - G** 4
  - H** 0
  - J** 5
- 

- 11** Olivia has 2 gallons and 3 quarts of vanilla ice cream and 1 gallon and 2 quarts of chocolate ice cream left over from a party.

What is the total number of gallons and quarts of ice cream that Olivia has left over?

- A** 1 gal 1 qt
  - B** 4 gal 1 qt
  - C** 5 gal 3 qt
  - D** 5 gal 1 qt
- 

- 12** Which fraction is equivalent to 1.5?

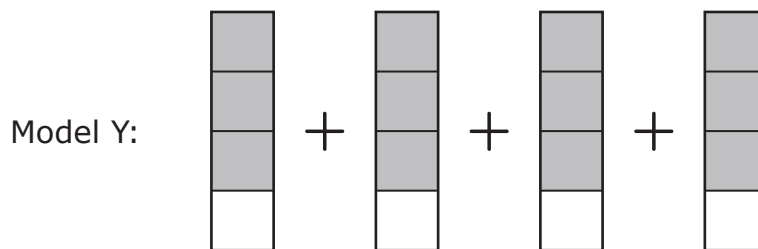
- F**  $\frac{15}{10}$
- G**  $\frac{15}{100}$
- H**  $\frac{100}{15}$
- J**  $\frac{10}{15}$

- 13** The rectangular top of Kathleen’s desk has a length of 24 inches and a width of 17 inches. What is the area of the top of Kathleen’s desk in square inches?
- A** 192 square inches  
**B** 82 square inches  
**C** 408 square inches  
**D** 41 square inches

- 14** The model is shaded to represent one whole.



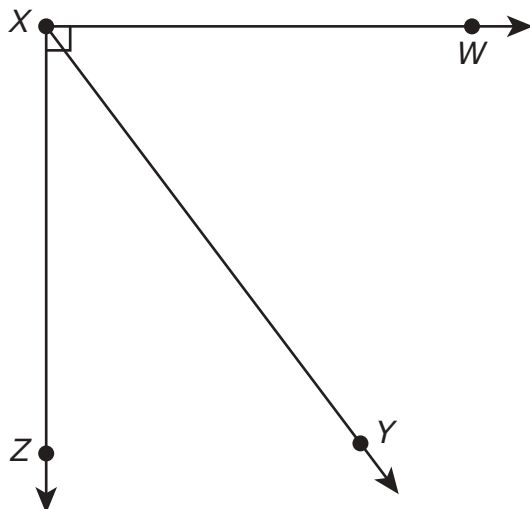
Model Y is shaded to represent a number greater than one.



Which expression CANNOT be used to represent this number?

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

15 The measure of angle  $WXZ$  is  $90^\circ$ . The measure of angle  $WXY$  is  $53^\circ$ .



What is the measure in degrees of angle  $YXZ$ ?

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

**16** Which expression has a quotient of about 7?

**F**  $7 \div 2$

**G**  $23 \div 7$

**H**  $36 \div 5$

**J**  $13 \div 6$

---

**17** Workers at a company fixed 37,015.08 meters of pipe. How is this number written in expanded notation?

**A**  $(3 \times 10,000) + (7 \times 1,000) + (1 \times 100) + (5 \times 10) + (8 \times 0.1)$

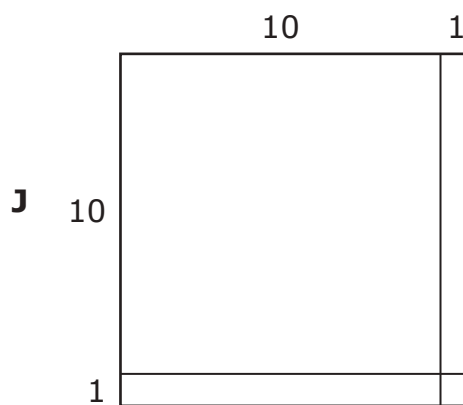
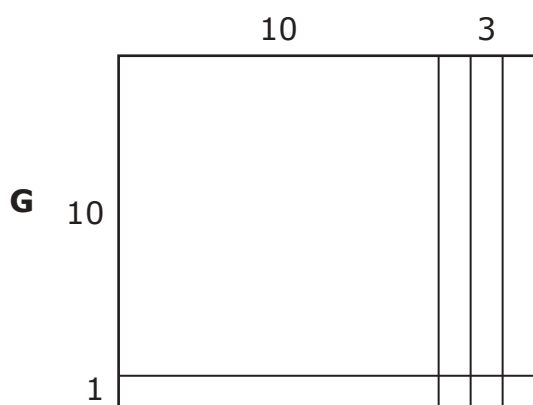
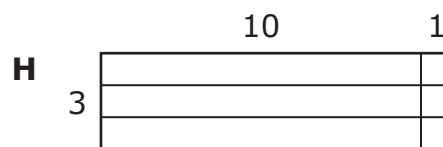
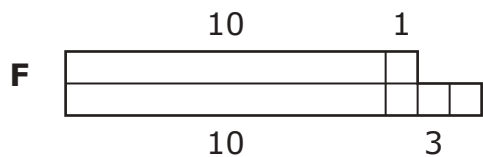
**B**  $(3 \times 10,000) + (7 \times 1,000) + (1 \times 10) + (5 \times 1) + (8 \times 0.1)$

**C**  $(3 \times 1,000) + (7 \times 100) + (1 \times 10) + (5 \times 1) + (8 \times 0.01)$

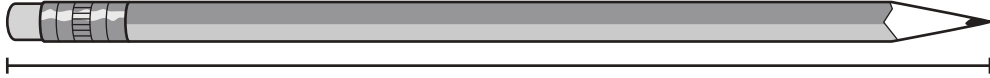
**D**  $(3 \times 10,000) + (7 \times 1,000) + (1 \times 10) + (5 \times 1) + (8 \times 0.01)$



18 Which model represents  $11 \times 13 = 143$ ?



- 19** Armando has two pencils in his desk. Use the ruler to measure the length of each pencil to the nearest centimeter.



Which measurement is closest to the difference in centimeters between the lengths of these two pencils?

- A** 9 cm
  - B** 1 cm
  - C** 23 cm
  - D** 3 cm
- 
- 20** The owners of a business rented 4,506.23 square feet of space in an office building. They plan to use 281.6 square feet of the space for the kitchen.

How many square feet of space are left?

- F** 4,224.63 square feet
- G** 4,385.43 square feet
- H** 4,478.07 square feet
- J** 4,225.17 square feet

**21** The table shows numbers of feet and the equivalent numbers of yards.

Feet-to-Yards Conversions

Number of Feet	Number of Yards
12	4
15	5
18	6
21	7

Nathan has a piece of chain that is 54 feet long. How many yards of chain does Nathan have?

- A** 22 yd
- B** 162 yd
- C** 18 yd
- D** 46 yd

**22** Each Saturday Mr. Franklin teaches 3 piano lessons at his music school and 4 piano lessons in students' homes.

- For each lesson at his music school, he charges \$15.
- For each lesson in a student's home, he charges \$20.

Which set of equations can be used to find  $m$ , the amount of money in dollars Mr. Franklin earns from piano lessons each Saturday?

**F**  $15 \times 4 = 60$   
 $20 \times 3 = 60$   
 $60 + 60 = m$

**G**  $15 \div 3 = 5$   
 $20 \div 4 = 5$   
 $5 + 5 = m$

**H**  $15 \times 3 = 45$   
 $20 \times 4 = 80$   
 $80 - 45 = m$

**J**  $15 \times 3 = 45$   
 $20 \times 4 = 80$   
 $45 + 80 = m$

**23** The list gives information about the favorite color of each of 22 students.

- 6 students chose red.
- 2 students chose yellow.
- 5 more students chose blue than yellow.
- 3 fewer students chose purple than red.
- The rest of the students chose green.

Which frequency table represents the number of students who chose each color?

Favorite Color

**A**

Color	Number of Students
Red	
Yellow	
Blue	
Purple	
Green	

Favorite Color

**C**

Color	Number of Students
Red	
Yellow	
Blue	
Purple	
Green	

Favorite Color

**B**

Color	Number of Students
Red	
Yellow	
Blue	
Purple	
Green	

Favorite Color

**D**

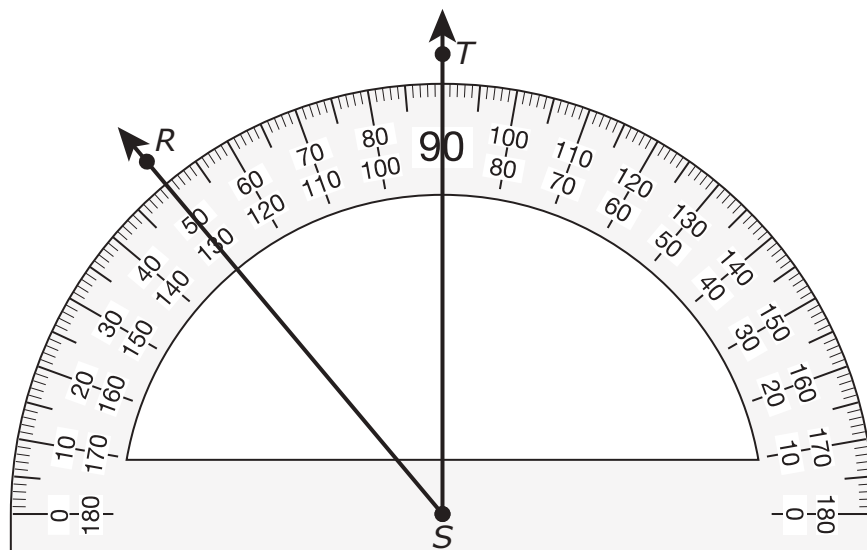
Color	Number of Students
Red	
Yellow	
Blue	
Purple	
Green	

- 24** Zeke used  $\frac{3}{4}$  cup white sugar,  $\frac{3}{4}$  cup brown sugar, and  $2\frac{1}{4}$  cups of flour to bake some cookies.

What was the difference between the amount of flour and the combined amount of sugar Zeke used?

- F**  $3\frac{3}{4}$  cups  
**G**  $1\frac{2}{4}$  cups  
**H**  $\frac{2}{4}$  cup  
**J**  $\frac{3}{4}$  cup
- 

- 25** What is the measure of angle  $RST$  to the nearest degree?



- A**  $40^\circ$   
**B**  $50^\circ$   
**C**  $130^\circ$   
**D**  $80^\circ$

- 26** A baker made 24 cakes each day for 2 days. He used 4 cups of flour for each cake he made.

What was the total number of cups of flour the baker used on these 2 days?

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

- 
- 27** The table shows the amounts Ms. McCulley paid for different expenses during the last three months.

Monthly Expenses

Expense	Month 1	Month 2	Month 3
Rent	\$1,600.00	\$1,600.00	\$1,600.00
Car payment	\$365.77	\$365.77	\$365.77
Groceries	\$462.55	\$398.89	\$421.36
Gasoline	\$130.56	\$141.35	\$133.30
Utilities	\$213.20	\$208.55	\$209.40

Which expenses were fixed expenses for Ms. McCulley during these three months?

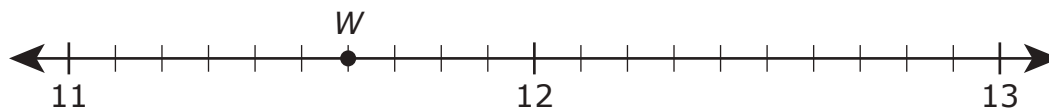
- A** Groceries, gasoline, and utilities only
- B** Rent and car payment only
- C** None of the expenses
- D** All of the expenses

**28** Martha bought a new box of cereal. In one week she ate  $\frac{4}{9}$  of the cereal.

Which is closest to the fraction of the cereal she had left?

- F** Less than  $\frac{1}{4}$  of the cereal was left.
  - G** Less than  $\frac{1}{2}$  of the cereal was left.
  - H** About  $\frac{1}{2}$  of the cereal was left.
  - J** About  $\frac{1}{4}$  of the cereal was left.
- 

**29** The number line shows point  $W$ .

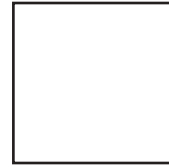
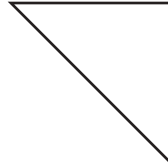
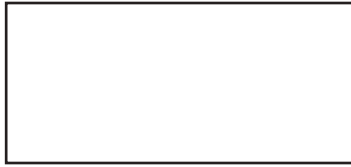


Which number does point  $W$  represent on the number line?

- A** 11.6
- B** 11.07
- C** 11.7
- D** 11.06



**30** These polygons belong in the same group.



Which statement best describes the polygons in this group?

- F** Each polygon has at least one pair of parallel sides.
- G** Each polygon has at least one obtuse angle.
- H** Each polygon has at least one right angle.
- J** Each polygon has at least one acute angle.

- 31** The table shows the relationship between the position of a number in a pattern and its value.

Position	Value
1	33
2	34
3	35
4	36

Which rule shows how to find the value when given the position?

- A**  $\times 33$
- B**  $- 32$
- C**  $\div 33$
- D**  $+ 32$

- 32** The table shows the fractions of the bulletin boards in four classrooms that will be used to display artwork.

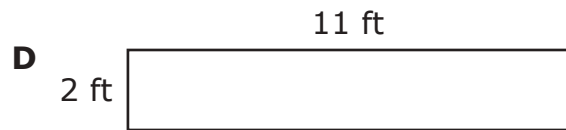
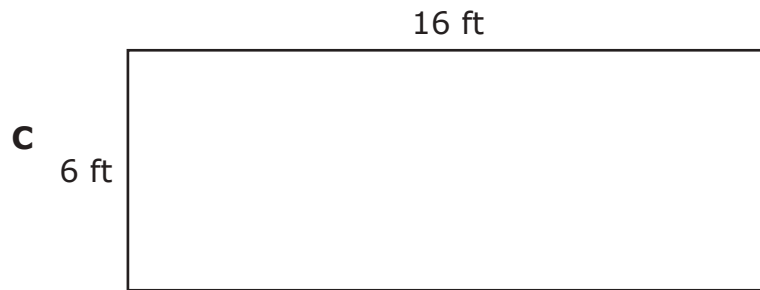
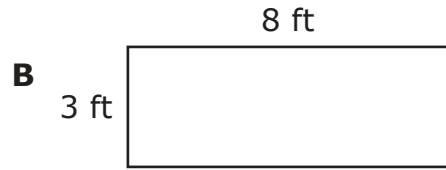
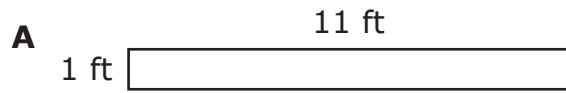
Artwork on Bulletin Boards

Teacher	Fraction for Artwork
Ms. Brady	$\frac{5}{10}$
Mr. Chang	$\frac{2}{4}$
Ms. Gupta	$\frac{5}{6}$
Mr. Taylor	$\frac{4}{8}$

Which comparison is true?

- F**  $\frac{2}{4} > \frac{4}{8}$
- G**  $\frac{4}{8} < \frac{5}{10}$
- H**  $\frac{5}{6} > \frac{4}{8}$
- J**  $\frac{5}{6} < \frac{5}{10}$

**33** The perimeter of a rectangular bulletin board is 22 feet. Which model could show the dimensions of this bulletin board in feet?



**34** Which expression is equivalent to  $\frac{9}{8}$ ?

**F**  $\frac{3}{8} + \frac{3}{8}$

**G**  $\frac{1}{2} + \frac{2}{3} + \frac{6}{3}$

**H**  $\frac{1}{9} + \frac{1}{9} + \frac{1}{9} + \frac{1}{9} + \frac{1}{9} + \frac{1}{9} + \frac{1}{9} + \frac{1}{9}$

**J**  $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$



Item Number	Reporting Category	Readiness or Supporting	Content Student Expectation	Correct Answer
1	1	Readiness	4.2(B)	A
2	2	Readiness	4.3(E)	H
3	1	Readiness	4.2(G)	B
4	4	Supporting	4.10(E)	F
5	2	Readiness	4.5(A)	C
6	3	Supporting	4.7(D)	F
7	4	Readiness	4.9(A)	57
8	3	Supporting	4.6(A)	J
9	1	Readiness	4.3(D)	B
10	2	Readiness	4.4(H)	J
11	3	Readiness	4.8(C)	B
12	1	Readiness	4.2(G)	F
13	3	Readiness	4.5(D)	C
14	1	Supporting	4.3(B)	G
15	3	Supporting	4.7(E)	37
16	2	Supporting	4.4(G)	H
17	1	Readiness	4.2(B)	D
18	2	Supporting	4.4(C)	G
19	3	Readiness	4.8(C)	D
20	2	Readiness	4.4(A)	F
21	3	Supporting	4.8(B)	C
22	2	Readiness	4.5(A)	J
23	4	Readiness	4.9(A)	B
24	2	Readiness	4.3(E)	J
25	3	Readiness	4.7(C)	A
26	2	Readiness	4.4(H)	192
27	4	Supporting	4.10(A)	B
28	2	Supporting	4.3(F)	H
29	1	Supporting	4.2(H)	A
30	3	Readiness	4.6(D)	H
31	2	Readiness	4.5(B)	D
32	1	Readiness	4.3(D)	H
33	3	Readiness	4.5(D)	B
34	1	Supporting	4.3(A)	J