
TENNESSEE

Standards Review and Assessment Grade 6



HOUGHTON MIFFLIN HARCOURT

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To the Student

These practice activities are correlated to the state performance indicators for grade 6 and are designed to prepare you to take Tennessee's grade 6 assessment test. The practice tests reflect the type of wording likely to be encountered on the actual test.

Mathematics State Performance Indicators

GRADE 6

Standard 1 – Mathematical Processes

State Performance Indicators:

- SPI 0606.1.1** Make conjectures and predictions based on data.
- SPI 0606.1.2** Judge the reasonableness of the results of rational number estimates and/or computations.
- SPI 0606.1.3** Use concrete, pictorial, and symbolic representation for integers.
- SPI 0606.1.4** Select the representation that models one of the arithmetic properties (commutative, associative, or distributive).
- SPI 0606.1.5** Model algebraic expressions using algebra tiles.

Standard 2 – Number & Operations

State Performance Indicators:

- SPI 0606.2.1** Solve problems involving the multiplication and division of fractions.
- SPI 0606.2.2** Solve problems involving the addition, subtraction, multiplication, and division of mixed numbers.
- SPI 0606.2.3** Solve problems involving the addition, subtraction, multiplication, and division of decimals.
- SPI 0606.2.4** Solve multi-step arithmetic problems using fractions, mixed numbers, and decimals.
- SPI 0606.2.5** Transform numbers from one form to another (fractions, decimals, percents, and mixed numbers).
- SPI 0606.2.6** Solve problems involving ratios, rates and percents.
- SPI 0606.2.7** Locate positive rational numbers on the number line.
- SPI 0606.2.8** Locate integers on the number line.

Standard 3 – Algebra

State Performance Indicators:

- SPI 0606.3.1** Represent on a number line the solution of a linear inequality.
- SPI 0606.3.2** Use order of operations and parentheses to simplify expressions and solve problems.
- SPI 0606.3.3** Write equations that correspond to given situations or represent a given mathematical relationship.
- SPI 0606.3.4** Rewrite expressions to represent quantities in different ways.
- SPI 0606.3.5** Translate between verbal expressions/sentences and algebraic expressions/equations.
- SPI 0606.3.6** Solve two-step linear equations using number sense, properties, and inverse operations.

Mathematics State Performance Indicators (continued)

SPI 0606.3.7 Use algebraic expressions and properties to analyze numeric and geometric patterns.

SPI 0606.3.8 Select the qualitative graph that models a contextual situation (e.g., water filling then draining from a bathtub).

SPI 0606.3.9 Graph ordered pairs of integers in all four quadrants of the Cartesian coordinate system.

Standard 4 – Geometry & Measurement

State Performance Indicators:

SPI 0606.4.1 Identify, define or describe geometric shapes given a visual representation or a written description of its properties.

SPI 0606.4.2 Find a missing angle measure in problems involving interior/exterior angles and/or their sums.

SPI 0606.4.3 Solve problems using the Triangle Inequality Theorem.

SPI 0606.4.4 Calculate with circumferences and areas of circles.

SPI 0606.4.5 Determine the surface area and volume of prisms, pyramids and cylinders.

SPI 0606.4.6 Given the volume of a cone/pyramid, find the volume of the related cylinder/prism or vice versa.

Standard 5 – Data Analysis, Statistics, & Probability

State Performance Indicators:

SPI 0606.5.1 Determine the theoretical probability of simple and compound events in familiar contexts.

SPI 0606.5.2 Identify features of graphs that may be misleading.

SPI 0606.5.3 Determine whether or not a sample is biased.

Pre Test

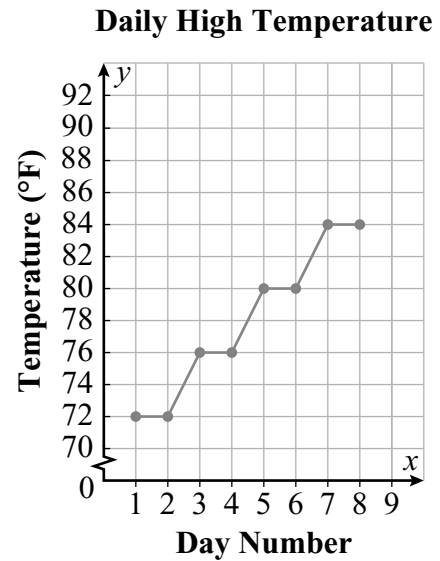
- 1** Luke's skis are $5\frac{2}{5}$ feet long. Marta's skis are $\frac{2}{3}$ as long as Luke's. How long are Marta's skis?

- A** $3\frac{3}{5}$ ft
B $4\frac{1}{2}$ ft
C $5\frac{4}{15}$ ft
D $8\frac{1}{10}$ ft

2 $\frac{4}{5} \times \frac{5}{16} =$

- F** $\frac{1}{4}$
G $\frac{25}{64}$
H $2\frac{14}{25}$
J 4

- 3** The graph shows that the daily high temperatures have formed a pattern for the last 8 days.



If the pattern continues for the next 2 days, what will be the daily high temperature on day 10?

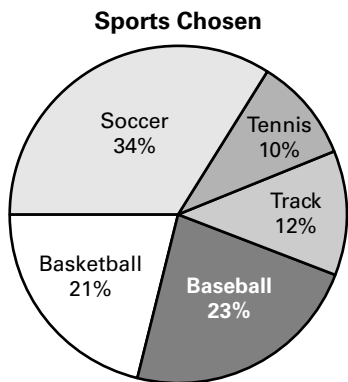
- A** 85°F
B 86°F
C 88°F
D 92°F

PreTest (continued)

- 4** The label on a gallon of whole milk says that the milk contains 3.3% fat. What is that number expressed as a decimal?

F 0.0033
G 0.033
H 0.33
J 3.3

- 5** A city asked its citizens to name their first choice for a new sports program. The graph shows the citizens' choices.



About 10,000 citizens answered. Based on the information in the graph, what is the closest prediction of the number of citizens who chose track or tennis?

A 1,000
B 1,200
C 2,000
D 2,200

- 6** Which expression is the same as $6(x + y)$?

F $6xy$
G $6x + y$
H $6x + 6y$
J $x + 6y$

- 7** A delivery truck can travel 240 miles on 30 gallons of gas. At that rate, how far could the truck travel on 15 gallons of gas?

A 8 miles
B 120 miles
C 360 miles
D 480 miles

PreTest (continued)

- 8** Divide 32.2 by 0.46.

F 0.007
G 0.7
H 7
J 70

- 9** What is the value of $2 \times (20 - 14)^2$?

A -156
B 72
C 144
D 236

- 10** Which expression represents the phrase
3 times the difference of 12 and y?

F $3(12 - y)$
G $3(y - 12)$
H $3 - (12 - y)$
J $3 - 12y$

- 11** Look at the equation below

$$4x - 2 = 6$$

What value of x makes the equation true?

A 2
B 3
C 12
D 14

- 12** The first six terms of a number pattern are shown below.

3, 7, 15, 31, 63, ...

Which expression can be used to find the value of any number in the pattern when p represents the previous number in the pattern?

F $p + 4$
G $p - 2$
H $2p + 1$
J $3p - 2$

PreTest (continued)

- 13** Which of these three-dimensional figures has two circular bases?

A cone
B cylinder
C rectangular prism
D rectangular pyramid

- 14** Use order of operations to simplify.

$$22 - 6 \div 2 + 3$$

F 11
G 22
H 10
J 16

- 15** Look at the table below.

x	3	5	7	9	11
y	12	20	28	36	44

Which equation can be used to find y in terms of x ?

A $y = 4x$
B $y = x + 2$
C $y = x + 9$
D $y = 3x$

- 16** Which equation below represents the associative property?

F $12 \cdot 1 = 12$
G $12 \cdot 3 = 3 \cdot 12$
H $(12 \cdot 1) \cdot 3 = 12 \cdot (1 \cdot 3)$
J $12 \cdot (1 + 3) = (12 \cdot 1) + (12 \cdot 3)$

PreTest (continued)

- 17** Which expression is equivalent to $5(3x + 2)$?

A $10x + 15$
B $15x + 7$
C $15x + 10$
D $25x$

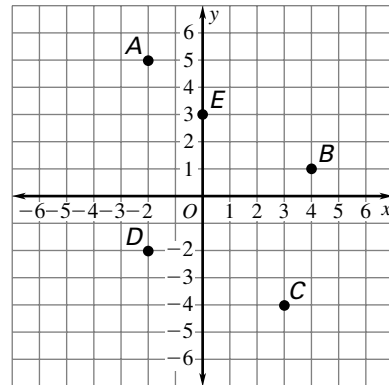
- 18** A health club charges \$32 each month and a one time registration fee of \$120. Miguel has spent a total of \$280. Which equation can be used to determine the number of months m Miguel has been a member of the health club?

F $120 + 32m = 280$
G $120 - 32m = 280$
H $120 \times 32m = 280$
J $280 + 32m = 120$

- 19** Which is the most reasonable estimate for the product of $5\frac{1}{9}$ and $9\frac{11}{12}$?

A 15
B 45
C 50
D 54

- 20** Which point is located at $(4, 1)$ on the grid below?



F point A
G point B
H point C
J point D

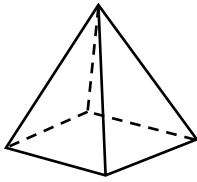
PreTest (continued)

- 21** Kevin has \$32.50. He wants to buy 2 shirts for \$12.89 each and 4 pairs of socks for \$3.49 a pair. How much more money will he need?

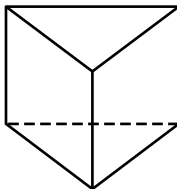
A \$7.24
B \$11.82
C \$16.12
D \$16.38

- 22** Which of these three-dimensional figures has four triangular faces and one square face?

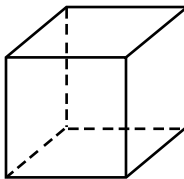
F



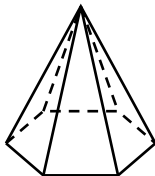
G



H



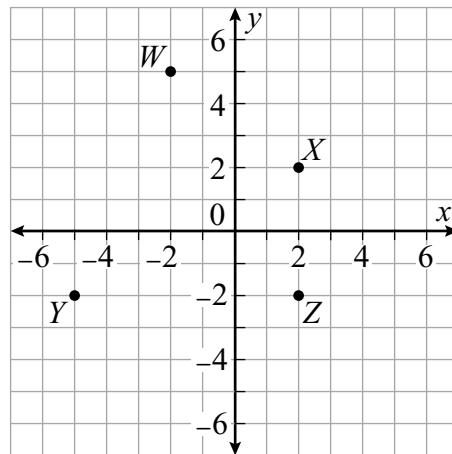
J



- 23** Mr. Lang, the art teacher, has 2 drawing projects, 4 painting projects, and 2 sculpture projects. He randomly chooses one project for his class. What is the probability it is a drawing project?

A $\frac{1}{4}$
B $\frac{1}{3}$
C $\frac{1}{2}$
D $\frac{2}{3}$

- 24** Which point best represents the ordered pair $(-2, 5)$ on this coordinate grid?



F point *W*
G point *X*
H point *Y*
J point *Z*

PreTest (continued)

- 25** The table below shows book sales at the local bookstore during the first 4 months of the year.

Month	Book Sales
January	\$1,150
February	\$1,000
March	\$1,220
April	\$1,500

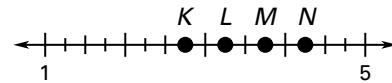
Between which two months could the change in book sales be represented by a negative integer?

- A** between January and February
- B** between February and March
- C** between March and April
- D** between January and April

- 26** Which expression is equivalent to $3(4y + 6)$?

- F** $(3 \cdot 4)y + 6$
- G** $(3 \cdot 4 \cdot 6)y$
- H** $(3 \cdot 4) + (3 \cdot 6)y$
- J** $(3 \cdot 4)y + (3 \cdot 6)$

- 27** Which point is closest to $3\frac{1}{4}$?



- A** Point *K*
- B** Point *L*
- C** Point *M*
- D** Point *N*

- 28** The Badilla family drove 806.3 miles on their vacation. Then they drove 439 miles to visit some friends. How many miles did the Badilla family drive in all?

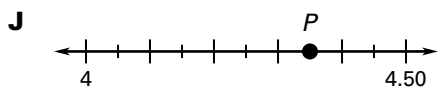
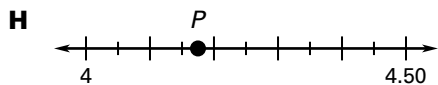
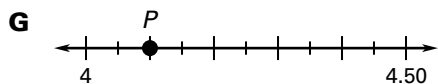
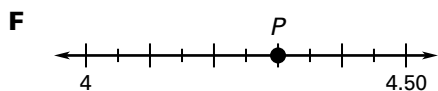
- F** 367.3
- G** 850.3
- H** 1,245.3
- J** 8,502

PreTest (continued)

- 29** Ann-Marie is balancing her checkbook. The balance from her last statement was \$562.86. Since then she has written several small checks and made no deposits. Which is a reasonable estimate for the new balance?

A \$491.71
B \$562.87
C \$571.65
D \$582.37

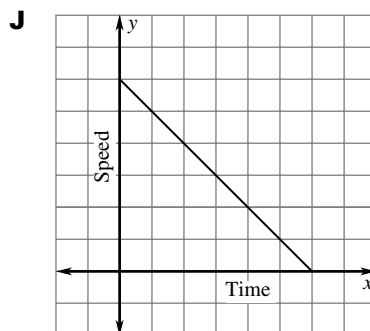
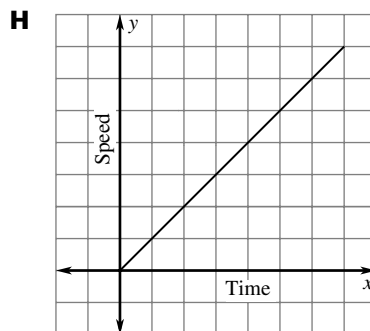
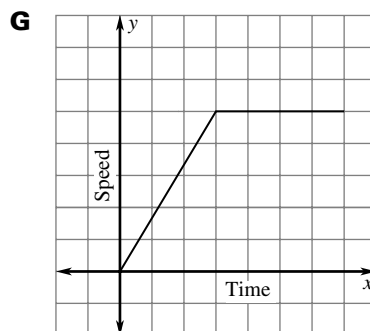
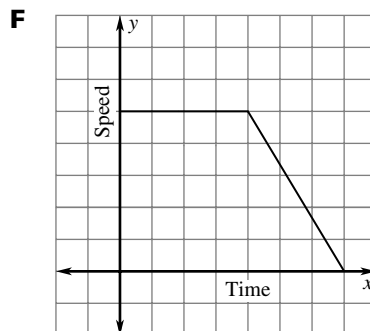
- 30** Which number line shows Point P located closest to 4.35?



- 31** What is the value of $2\frac{4}{9} - 1\frac{5}{6}$?

A $\frac{11}{18}$
B $1\frac{1}{3}$
C $3\frac{2}{3}$
D $4\frac{5}{18}$

- 32** Ms. Watson is driving along a highway at 65 miles per hour. She exits the highway, pulls into a parking lot, and stops. Which graph best shows her speed as she drives?

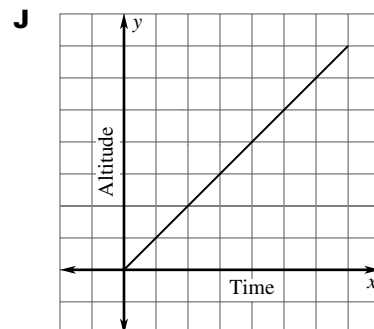
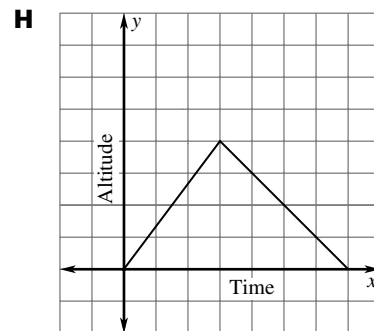
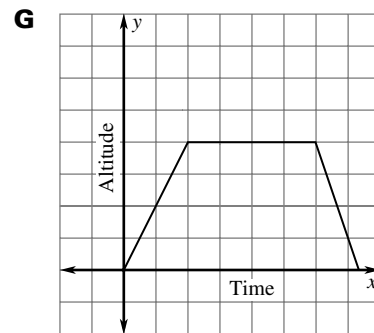
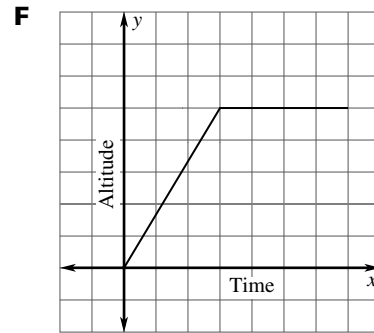


PreTest (continued)

- 33** Jamal had 14 CDs. He gave 3 of his friends each an equal number of his CDs. Then Jamal bought 4 new CDs. Which equation can be used to find n , the number of CDs Jamal has now after giving away x CDs to each of his friends?

- A** $n = 14 + x - 4$
B $n = 14 - x + 4$
C $n = 14 - 3x + 4$
D $n = 14 + 3x - 4$

- 34** Carlton rides his bicycle up a hill and across the flat hilltop. Then he rides down the other side of the hill. Which graph best represents Carlton's movement as he rides up, across, and down the hill?

**GO ON** 

PreTest (continued)

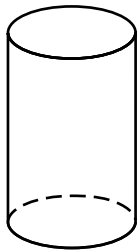
- 35**
- Look at the expression below.

$$\frac{3n}{2} - 9$$

Which of these has the same meaning as the expression?

- A** nine less than the sum of three times a number n and two
- B** nine less than the quotient of three times a number n divided by two
- C** the difference between nine and two less than three times a number n
- D** the difference between nine and the quotient when two is divided by three times a number n

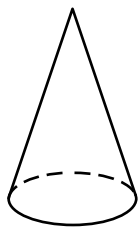
- 36**
- A cylinder and a cone are shown below.



$$V = 990 \text{ cm}^3$$

$$V (\text{cylinder}) = Bh$$

B = area of the base of the figure



$$V = ?$$

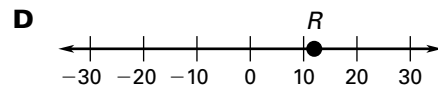
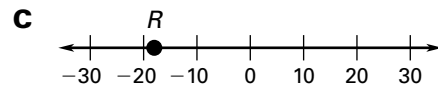
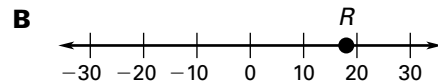
$$V (\text{cone}) = \frac{1}{3}Bh$$

B = area of the base of the figure

The cylinder and the cone have equal heights and bases of equal area. What is the volume of the cone?

- F** 330 cm^3
- G** 990 cm^3
- H** $1,800 \text{ cm}^3$
- J** $2,970 \text{ cm}^3$

- 37**
- Which number line best shows Point
- R
- at
- -18
- ?



- 38**
- A real estate agent wants to learn about apartment rental fees in her town. Which is the best method of collecting unbiased data?

- F** Call 20 landlords selected at random and ask them how much rent they charge on each unit they own.
- G** Use the real estate ads to find the rent for 20 one-bedroom apartments.
- H** Research rents in a quiet neighborhood near the park and shops.
- J** Find out the rent on all the units in the largest apartment building in town.

PreTest (continued)

- 39** Jin read $\frac{1}{4}$ of a book the first day, $\frac{1}{2}$ the second day, and $\frac{1}{8}$ the third. She finished the book on the fourth day. What part of the book did Jin read on the fourth day?

A $\frac{1}{8}$
B $\frac{3}{8}$
C $\frac{5}{8}$
D $\frac{7}{8}$

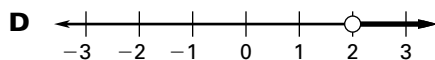
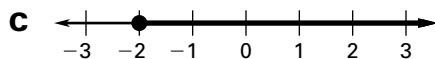
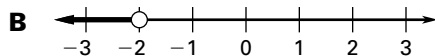
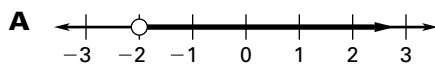
- 40** Look at the equation below.

$$\frac{18}{n} = 6$$

What value of n makes the equation true?

F 2
G 3
H 4
J 9

- 41** Which number line shows solutions of $-2x < 4$?



- 42** A circle had a diameter of 10 centimeters. Which measurement is closest to the area of the circle? (Use $A = \pi r^2$ and $\pi = 3.14$.)

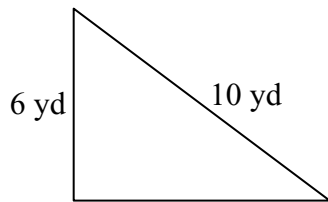
F 15.7 cm^2
G 31.4 cm^2
H 78.5 cm^2
J 314 cm^2

- 43** Miguel has a garden that has an area of 315 square feet. If the corn in his garden covers 190 square feet, what percent of the garden is corn? Round to the nearest whole percent if necessary.

A 50%
B 55%
C 60%
D 65%

PreTest (continued)

- 44** Which could be the measure of the third side in the triangle below?



- F** 60 yd
- G** 36 yd
- H** 16 yd
- J** 8 yd

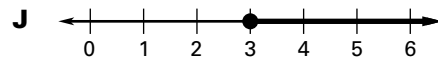
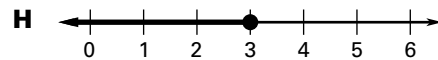
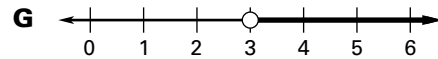
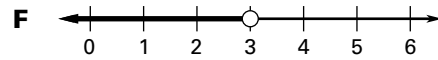
- 45** The first six terms of a number pattern are shown below.

2, 6, 14, 30, 62, 138, ...

Which expression can be used to find the value of any number in this pattern when n represents the previous number in the pattern?

- A** $3n$
- B** $n + 4$
- C** $2n + 2$
- D** $3n - 4$

- 46** Which number line shows solutions of $x + 3 \leq 6$?

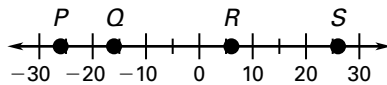


PreTest (continued)

- 47** Which expression below shows $7(6 + 5)$ after the distributive property is applied?

A $(7 \cdot 6) + 5$
B $(7 \cdot 6) + (7 + 5)$
C $(7 + 6) + (7 + 5)$
D $(7 \cdot 6) + (7 \cdot 5)$

- 48** The temperature was -26°F in part of Antarctica today. Which point on the number line is the closest to -26 ?



F Point *P*
G Point *Q*
H Point *R*
J Point *S*

For questions 49–50 use the key below.

Key	
	= 1
	= x

- 49** Which model below represents $4x + 3$?

A

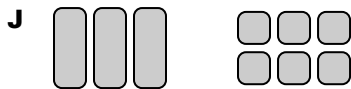
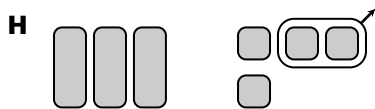
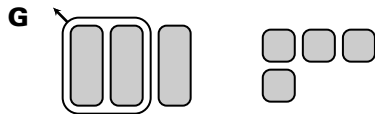
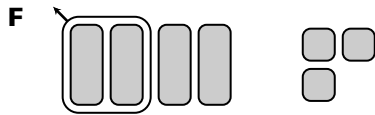
B

C

D

PreTest (continued)

- 50** Which model below represents $(3x + 4) - 2$?

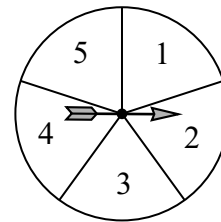
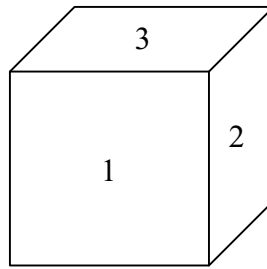


- 51** All of the following show another way to write the part of a kilogram shown on the yogurt container, except which one?

- A** $\frac{7}{10}$
B 0.170
C $\frac{1}{10} + \frac{7}{100}$
D $\frac{17}{100}$



- 52** The number cube has faces labeled 1 through 6. The spinner has 5 equal sections labeled 1 through 5.



What is the probability that the number cube will land on an even number and the spinner will land on 5?

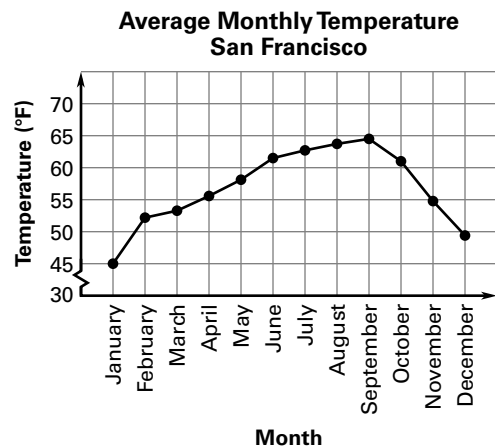
- F** $\frac{1}{10}$
G $\frac{1}{15}$
H $\frac{7}{10}$
J $\frac{4}{11}$

Pre Test (continued)

- 53** A farmer plowed $\frac{5}{8}$ of his field. Then he planted corn on $\frac{2}{3}$ of the plowed part of the field. What fraction of the whole field was planted with corn?

A $\frac{1}{6}$
B $\frac{1}{4}$
C $\frac{5}{12}$
D $\frac{15}{16}$

- 54** Beatrice claims the graph below shows that if the temperature in August was 64°F , the temperature in January must have been around 30°F . Why might she have made this error?



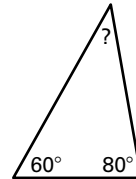
- F** The units on the horizontal axis make it difficult to read the months.
- G** The increments on the vertical axis are too large to see differences.
- H** The broken vertical axis exaggerates the differences between the temperatures.
- J** The broken vertical axis minimizes the differences between the temperatures.

Pre Test (continued)

- 55** To the nearest whole meter, what is the circumference of a circle that has a diameter of 14 meters? (Use $C = \pi d$ and $\pi \approx 3.14$.)

A 6 meters
B 22 meters
C 44 meters
D 88 meters

- 56** What is the measure of the missing interior angle for the figure shown below?



F 40°
G 80°
H 140°
J 220°

Pre Test (continued)

- 57** One side of a triangle is 3 inches. The second side is 7 inches. Which could be the measure of the third side of the triangle?

A 9 in.
B 10 in.
C 13 in.
D 21 in.

- 58** All of the following situations can be represented by the integer 10, except which one?

F a balloon rises 10 ft into the air
G the stock market gains 10 points
H the town lies 10 ft below sea level
J Jon received a gift of \$10

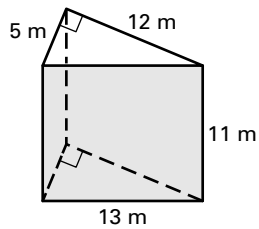
PreTest (continued)

- 59** What is the surface area of the prism?

Surface Area = sum of the area of the faces

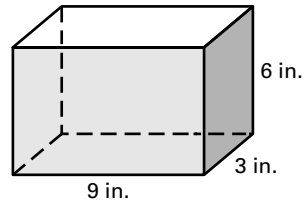
Area of a Rectangle = lw

Area of a Triangle = $\frac{1}{2}bh$



- A** 93 m^2
B 330 m^2
C 390 m^2
D 489 m^2

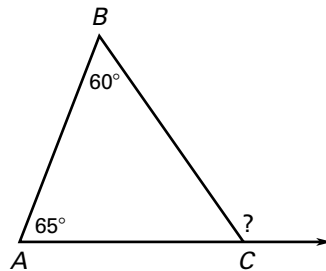
- 60** What is the volume of the rectangular prism? ($V_{\text{rectangular prism}} = lwh$)



- F** 18 in.^3
G 72 in.^3
H 81 in.^3
J 162 in.^3

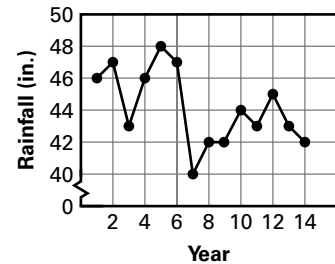
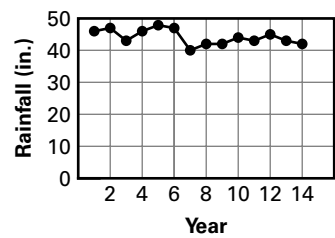
Pre Test (continued)

- 61** What is the measure of the exterior angle labeled “?” in the figure below?



- A** 55°
B 80°
C 120°
D 125°

- 62** The graphs below show the same data.

Average Rainfall**Graph I****Yearly Rainfall****Graph II**

One student uses Graph 1. Another uses Graph 2. What graph feature is *most likely* to cause the students to draw different conclusions?

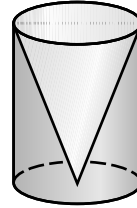
- F** The scale on Graph 1 is broken from 0 to 40.
G There is no data for 0-40 inches on Graph 2.
H The y-axis scales are different.
J The titles are different.

PreTest (continued)

63 A museum director wants to know which types of exhibits will attract more people. The director surveyed 100 visitors on a Sunday afternoon. Why is the data collected in this survey biased?

- A** The director needs to sample the entire population of potential visitors.
- B** The director should survey only people visiting the newest exhibit in the museum.
- C** The sample is not large enough. The director should survey at least 1,000 people.
- D** The people surveyed are already at the museum. The director needs to survey people who do not go to the museum.

64 A cone within a cylinder is shown below. The volume of the cone is 220 cm^3 .



$$V(\text{cone}) = \frac{1}{3}Bh$$

$$V(\text{cylinder}) = Bh$$

B = area of the base of the figure

The cone and the cylinder have equal heights and the area of their bases is equal. What is the volume of the cylinder in cubic centimeters?

- F** 220 cm^3
- G** 440 cm^3
- H** 660 cm^3
- J** 880 cm^3

SPI 0606.1.1

Make conjectures and predictions based on data.

- 1** The table shows the results of a survey that asked 100 students on the track team their favorite type of exercise.

Exercise	People
Jogging	50
Weightlifting	30
Aerobics	10
Other	10

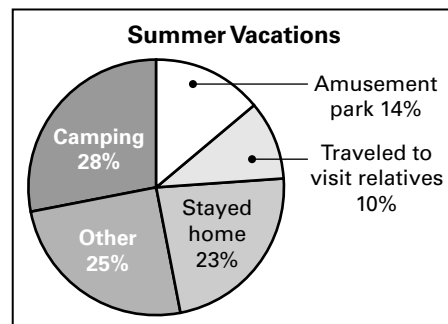
If 10 new team members are asked the same question, which is most likely to happen?

- A** Five of them will choose jogging.
- B** All of them will choose jogging.
- C** None of them will choose jogging.
- D** One of them will choose weightlifting.

- 2** A manufacturer makes 1,040,000 balloons. The manufacturer tests 200 balloons and finds that 32 have holes. About how many of the balloons that were manufactured are likely to have holes?

- F** 32
- G** 163
- H** 166,368
- J** 166,400

- 3** The graph shows how students at River Road Middle School spent their summers.



There are about 800 students at the school. Based on the information in the graph, what is the closest prediction of the number of students who stayed home or traveled to visit relatives?

- A** 80
- B** 184
- C** 192
- D** 264

SPI 0606.1.1 (continued)

- 4** Mrs. Hudson sampled her grade 6 class for eye color.

Eye Color	Number of Students
Gray	7
Brown	15
Blue	6
Green	2

If the school has 800 students, how many would be expected to have brown eyes, according to the sample?

- F** 160
G 184
H 243
J 400

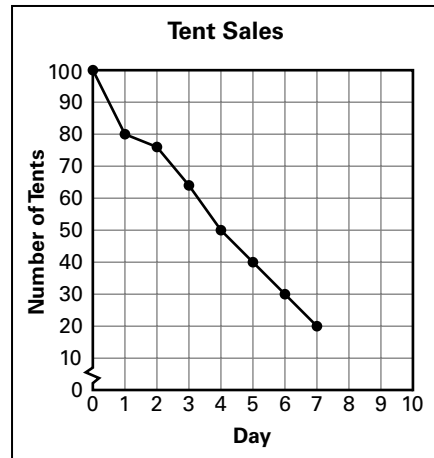
- 5** The table shows the population of a small town from 2007 to 2010.

Year	Population
2007	3,554
2008	3,690
2009	3,826
2010	3,962
2011	
2012	

What is the best prediction for the population in 2012?

- A** 3,998
B 4,098
C 4,234
D 5,370

- 6** A store had an end-of-season sale on camping tents. The graph shows the number of tents left at the end of each day.



By the end of which day is the store likely to have sold all its tents?

- F** day 7
G day 8
H day 9
J day 10

SPI 0606.1.2

Judge the reasonableness of the results of rational number estimates and/or computations.

- 1** Which is the most reasonable estimate for the product of 4.09 and 6.92?

A 24
B 28
C 30
D 35

- 2** A skateboard regularly sells for \$78.99. Why is \$59.24 a reasonable sale price if the skateboard is discounted 25%?

F $80 \times 0.25 = 59$
G $\frac{1}{4} \times 80 = 20$ and $80 - 20 = 60$
H $70 \times 0.80 = 56$
J $80 \times 0.8 = 64$

- 3** Candice simplified $7\frac{2}{3} + 2\frac{1}{6} + 11\frac{8}{9}$.

Her final answer was $19\frac{11}{18}$. All of the solutions below are reasonable except which one?

A The LCM of 3, 6, and 9 is 18.
B The final answer should be less than 20 because $7 + 2 + 11 = 20$.
C The final answer should be greater than 20 because $7 + 2 + 11 = 20$.
D The fractional part of the answer should have a denominator of 9.

- 4** Dario received \$85 for his birthday. He wants to use the money to buy concert tickets. If the tickets cost \$18 each, how many tickets can Dario purchase?

F 4
G 4.72
H 5
J 5.72

SPI 0606.1.2 (continued)

- 5** Peter is multiplying 4.119 by 10.006. All of the estimates below for the solution are reasonable except which one?

A 39
B 40
C 41
D 42

- 6** Charlie has a garden that has an area of 305 square feet. About 60% of the area is planted with beans, and Charlie calculates that this is 183 square feet. How can he check his estimate?

F Find 10% of 300 and multiply this amount by 6.
G Find 50% of 300 and add 10% of 300 to this amount.
H Divide 190 by 300 to see if the result is close to 0.60.
J All of the above.

- 7** You buy a jacket that costs \$49.95. The sales tax is 6%. Which is a reasonable estimate for the total cost of the jacket?

A \$42
B \$47
C \$53
D \$56

- 8** A CD costs \$19.95. Jake gets a 10% discount. About how much does he pay for the CD?

F \$2
G \$18
H \$20
J \$22

SPI 0606.1.3

Use concrete, pictorial, and symbolic representation for integers.

- 1** All of the following situations below can be represented by the integer 18 except which one?

A The population increased by 18.
B Jon earned \$18 by pet sitting.
C 18 gallons of water flowed out of the water tank.
D The football team gained 18 yards.

- 2** A company produced 5,000 shoelaces in 5 hours on Monday. On Tuesday it produced 5,250 shoelaces in 5 hours. Which integer represents the change in the number of shoelaces produced from Monday to Tuesday?

F 250
G 25
H -25
J -250

- 3** A hawk flew up to a height of 46 feet and then dove 18 feet toward the ground. Which integer describes the hawk's height now?

A 54
B 28
C -28
D -54

- 4** Sean borrowed \$19 from his Dad. On Saturday he gets a \$5 allowance for his weekly chores. What integer describes his financial situation when he receives his allowance?

F 24
G 14
H -14
J -24

SPI 0606.1.3 (continued)

- 5** Nicole went snow skiing. When she left the slopes on Saturday, the temperature was -3°C . The temperature dropped 11 degrees by the time the sun went down that evening. What was the temperature when the sun went down?

A 8°C
B -8°C
C -11°C
D -14°C

- 6** A submarine descended 300 feet below sea level and then descended another 800 feet. What is the final depth of the submarine?

F 1,100 ft
G 500 ft
H -500 ft
J $-1,100$ ft

- 7** At 6 A.M. the temperature was 4°F below zero. By noon, the temperature had increased 10 degrees. What was the temperature at noon?

A -14°F
B -4°F
C 6°F
D 8°F

SPI 0606.1.4

Select the representation that models one of the arithmetic properties (commutative, associative, or distributive).

- 1** Peter wants to show that $2x + 3$ is equivalent to $3 + 2x$. What property would he use?

A associative
B distributive
C commutative
D algebraic

- 2** Which expression is equivalent to $5 + (2 + 3)$ and shows the associative property?

F $(5 + 2) + (5 + 3)$
G $(5 + 2) + 3$
H $5 + (3 + 2)$
J $(2 + 3) + 5$

- 3** Which is an example of the distributive property?

A $2 + 3 = 3 + 2$
B $(1 + 2) + 3 = 1 + (2 + 3)$
C $2(1 + 3) = 2 \times 1 + 2 \times 3$
D $2 \times 0 = 0$

- 4** Which property of multiplication allows the expression $4(-3)(-25)$ to be rewritten as $4(-25)(-3)$?

F commutative
G associative
H inverse
J identity

SPI 0606.1.4 (continued)

- 5** Rubin followed the steps shown to rewrite an expression.

$$\begin{aligned}6(x + 3) &= 6x + 18 \\ &= 18 + 6x\end{aligned}$$

Which properties did he use?

- A** associative and commutative
- B** associative and distributive
- C** distributive and commutative
- D** associative, distributive, and commutative

- 6** Which is an example of the commutative property?

- F** $2 + 3 = 3 + 2$
- G** $(1 + 2) + 3 = 1 + (2 + 3)$
- H** $2(1 + 3) = 2 \times 1 + 2 \times 3$
- J** $2 \times 0 = 0$

- 7** Latisha followed the steps shown to rewrite an expression.

$$\begin{aligned}(2x) \times 5 &= 5 \times (2x) \\ &= (5 \times 2) \times x\end{aligned}$$

Which properties did she use?

- A** associative and distributive
- B** commutative and associative
- C** distributive and commutative
- D** associative, distributive, and commutative

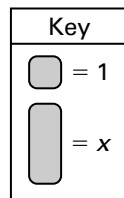
- 8** Dinish is given the expression $4 + (5 \times 4)$. He wants to use the commutative property. Which expression is NOT equivalent to the original expression?

- F** $(5 \cdot 4) + 4$
- G** $(4 \cdot 5) + 4$
- H** $4 + (4 \cdot 5)$
- J** $(4 \cdot 4) + (4 \cdot 5)$

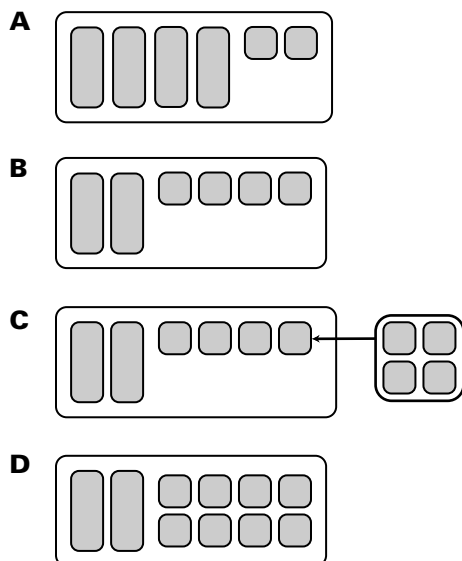
SPI 0606.1.5

Model algebraic expressions using algebra tiles.

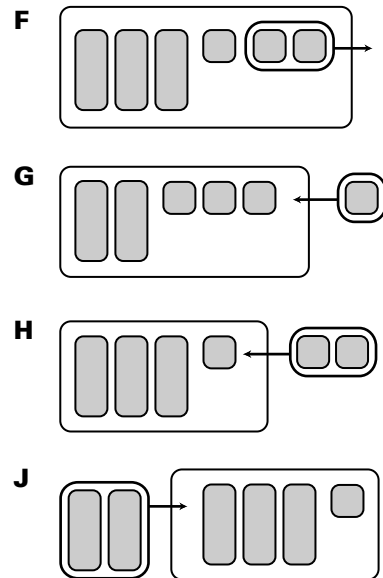
For questions 1–5, use the key below.



1 Which model below represents $2x + 4$?

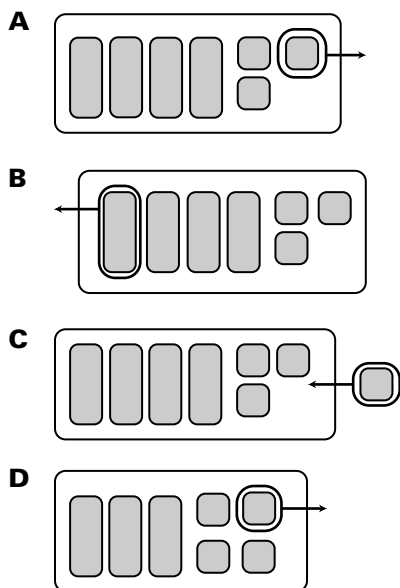


2 Which model below represents $(3x + 1) + 2$?

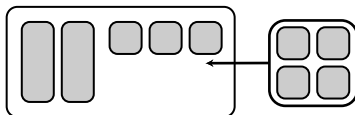


SPI 0606.1.5 (continued)

- 3** Which model below represents $(4x + 3) - 1$?

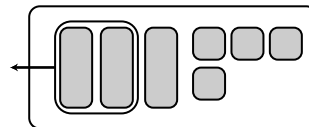


- 4** Which expression is represented by the model?



- F** $5x + 4$
G $(2x + 3) + 4x$
H $(2x + 3) - 4$
J $(2x + 3) + 4$

- 5** Which expression is represented by the model?



- A** $(x + 4) - 2x$
B $(3x + 4) - 2x$
C $(4x + 3) - 2$
D $(3x + 4) + 2x$

SPI 0606.2.1

Solve problems involving the multiplication and division of fractions.

- 1** What is $\frac{1}{2} \div \frac{2}{3}$?

A $\frac{1}{3}$
B $\frac{3}{5}$
C $\frac{3}{4}$
D $\frac{4}{3}$

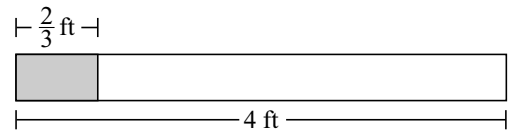
- 2** What is the product of $\frac{4}{9}$ and 10?

F $\frac{2}{45}$
G $2\frac{1}{4}$
H $4\frac{4}{9}$
J $22\frac{1}{2}$

- 3** Simplify $\left(\frac{1}{3} \times \frac{1}{4}\right) \times \frac{1}{2}$.

A $\frac{1}{24}$
B $\frac{1}{14}$
C $\frac{1}{9}$
D $\frac{1}{4}$

- 4** Maria plans to cut a 4-foot piece of fabric into pieces that are $\frac{2}{3}$ ft long, as shown in this diagram.



How many pieces can she get from this piece of fabric?

F 6 pieces
G 5 pieces
H 4 pieces
J 3 pieces

SPI 0606.2.1 (continued)

- 5** Cathy needs $\frac{3}{4}$ cup of orange juice for 1 bowl of punch. If Cathy wants to make 5 bowls, how many cups of orange juice does she need?

A $\frac{3}{20}$ c
B $\frac{8}{9}$ c
C 2 c
D $3\frac{3}{4}$ c

- 6** Seth has $\frac{3}{4}$ of a pizza to share with 6 friends. If he cuts it into equal-sized pieces, how much of a whole pizza will each friend get?

F $\frac{1}{9}$
G $\frac{1}{8}$
H $\frac{1}{6}$
J $\frac{1}{4}$

- 7** A nursery worker has 9 gallons of liquid tree fertilizer. If he gives $\frac{3}{4}$ gallon to each tree, how many trees can he feed?

A 6
B 12
C 27
D 36

- 8** A recipe for one batch of modeling clay needs $\frac{3}{4}$ cup of dry clay mix and water. Lemar wants to make $\frac{2}{3}$ of a batch. How much clay mix does he need?

F $\frac{1}{6}$ c
G $\frac{1}{2}$ c
H $\frac{2}{3}$ c
J $1\frac{1}{8}$ c

SPI 0606.2.2

Solve problems involving the addition, subtraction, multiplication, and division of mixed numbers.

1 Add $12\frac{2}{3} + 7\frac{3}{4}$.

A $19\frac{1}{2}$

B $20\frac{1}{4}$

C $20\frac{5}{12}$

D 21

2 Subtract $14 - 9\frac{7}{10}$.

F $4\frac{3}{10}$

G $4\frac{1}{2}$

H $5\frac{3}{10}$

J $5\frac{7}{10}$

3 What is $\frac{3}{4}$ of $1\frac{5}{6}$?

A $\frac{5}{8}$

B $1\frac{1}{8}$

C $1\frac{3}{8}$

D $2\frac{7}{12}$

4 Divide $4\frac{2}{3} \div 6$.

F $\frac{1}{28}$

G $\frac{7}{9}$

H $1\frac{2}{9}$

J 28

SPI 0606.2.2 (continued)

- 5** In the month of May, it rained $3\frac{1}{4}$ inches.
In the month of June, it rained $2\frac{5}{8}$ inches.
What was the total amount of rain in May and June?

A $\frac{5}{8}$ in.
B $\frac{7}{8}$ in.
C $5\frac{1}{2}$ in.
D $5\frac{7}{8}$ in.

- 6** A small-size can holds $8\frac{1}{2}$ ounces of peas.
A medium-size can holds $13\frac{2}{3}$ ounces of peas. How many more ounces of peas does a medium-size can hold than a small-size can?

F 5
G $5\frac{1}{6}$
H $5\frac{1}{3}$
J $5\frac{1}{2}$

- 7** Rashid cut an entire length of string into 18 pieces, each $2\frac{1}{4}$ feet (ft) long. What was the length of the string before Rashid cut it?

A $4\frac{1}{2}$ ft
B 8 ft
C 10 ft
D $40\frac{1}{2}$ ft

- 8** The trail to Hidden Lake is $3\frac{1}{2}$ miles. If Robin hikes the trail at an average speed of $2\frac{1}{3}$ miles per hour, how long will it take her to get to Hidden Lake?

F $1\frac{1}{3}$ h
G $1\frac{1}{2}$ h
H $2\frac{1}{3}$ h
J $2\frac{1}{2}$ h

SPI 0606.2.2 (continued)

- 9** Tito runs $3\frac{3}{4}$ miles every day. How far does Tito run in 7 days?

A $10\frac{3}{4}$ mi
B 21 mi
C $22\frac{3}{4}$ mi
D $26\frac{1}{4}$ mi

- 10** When Nick entered the fifth grade, he was $58\frac{1}{2}$ inches tall. When he entered sixth grade, Nick had grown $4\frac{3}{4}$ inches. How tall was Nick when he entered sixth grade?

F $62\frac{1}{4}$ inches
G $62\frac{1}{2}$ inches
H 62 inches
J $63\frac{1}{4}$ inches

- 11** Alissa bought $2\frac{1}{3}$ pounds of oranges, $3\frac{1}{4}$ pounds of bananas, and $1\frac{1}{2}$ pounds of apples. How many pounds of fruit did she buy in all?

A $6\frac{3}{4}$
B $6\frac{11}{12}$
C $7\frac{1}{12}$
D $7\frac{1}{2}$

- 12** A piece of lumber is 12 feet long. How many $2\frac{2}{5}$ -foot lengths can be cut from the lumber?

F 3
G 5
H 6
J 24

SPI 0606.2.2 (continued)

- 13** Bill made a vegetable garden that had a total area of $5\frac{3}{4}$ square meters. The area of the vegetable garden was $1\frac{1}{2}$ times as great as the area of Bill's flower garden. What was the area of the flower garden?

A $3\frac{5}{6}$ square meters
B $4\frac{1}{4}$ square meters
C $7\frac{1}{4}$ square meters
D $8\frac{5}{8}$ square meters

- 14** An average bumblebee is $1\frac{1}{2}$ inches long. An average boxelder bug is $\frac{5}{8}$ inch long. How much longer is a bumblebee than a boxelder bug?

F $\frac{1}{2}$
G $\frac{3}{4}$
H $\frac{7}{8}$
J $2\frac{1}{8}$

- 15** Manny lives $3\frac{3}{5}$ miles from Jean. They met halfway between their homes. How far did each of them travel?

A $1\frac{4}{5}$ mi
B $2\frac{2}{5}$ mi
C $3\frac{1}{5}$ mi
D $7\frac{1}{5}$ mi

SPI 0606.2.3

Solve problems involving the addition, subtraction, multiplication, and division of decimals.

1 Subtract $210 - 13.88$.

- A** 71.2
- B** 196.12
- C** 208.61
- D** 223.88

2 Add $3.89 + 0.3 + 9.872$.

- F** 5.1772
- G** 10.263
- H** 10.561
- J** 14.062

3 Multiply 9.573 by 8.06.

- A** 8.23278
- B** 77.15838
- C** 82.3278
- D** 771.5838

4 Divide 43.6 by 0.27.

- F** 11.772
- G** 16.15
- H** 117.72
- J** 161.48

SPI 0606.2.3 (continued)

- 5** Ken drove 196.3 miles from home to Baker City. From Baker City he drove 132.284 miles to Oak Town. How many miles did Ken drive on his trip to Oak Town?

A 64.016 miles
B 134.247 miles
C 151.914 miles
D 328.584 miles

- 6** Emily had \$40 to spend. After she bought some art supplies, she had \$13.91 left. How much did the art supplies cost?

F \$26.09
G \$33.99
H \$38.61
J \$53.91

- 7** A large container of pasta salad at Grocery Mart sells for \$6.75. If the container holds 3 pounds of pasta salad, what is the price per pound for pasta salad?

A \$225.00
B \$22.50
C \$2.25
D \$0.22

SPI 0606.2.3 (continued)

- 8** If the sales tax is 0.06, how much tax will Jennifer pay on a \$24.99 DVD set? Round to the nearest cent.

F \$0.42
G \$1.50
H \$2.49
J \$4.17

- 9** A machinist makes precision pipes in two sizes of diameters. One pipe has a diameter of 1.6795 centimeters. The other pipe has diameter of 3.24 centimeters. What is the difference in the diameters of the two pipes?

A 1.5605 cm
B 1.6471 cm
C 4.9195 cm
D 5.4416 cm

- 10** Sue bought a coat for \$59.50 and a pair of shoes for \$25.39. If she paid \$4.65 in sales tax, what was her total cost?

F \$36.43
G \$79.80
H \$84.89
J \$89.54

SPI 0606.2.3 (continued)

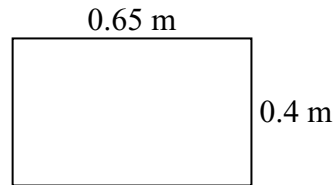
- 11** Ms. Singh worked for 7.5 hours and earned \$64.50. How much did she earn per hour?

A \$0.86
B \$8.60
C \$86.00
D \$483.75

- 12** Ms. Carter is making a hooked rug. She has 12 feet of blue yarn and wants to cut it into lengths of 0.236 feet each. How many whole lengths can Ms. Carter get from the blue yarn?

F 2
G 3
H 50
J 51

- 13** Mark drew the rectangle below.



What is the area of Mark's rectangle?

$$\text{Area} = l \times w$$

- A** 0.26 m^2
B 2.6 m^2
C 26 m^2
D 260 m^2

SPI 0606.2.4

Solve multi-step arithmetic problems using fractions, mixed numbers, and decimals.

- 1** Marc had \$43.60 saved for art supplies. He spent \$11.89 for water color paper and \$5.98 for a brush. He wants to spend \$100 on a new easel. Based on the amount he has left, how much more money will Mark need?

A \$25.73
B \$38.53
C \$61.47
D \$74.27

- 2** A recipe for 8 cups of punch says to use $2\frac{3}{8}$ cups of orange juice, $1\frac{3}{4}$ cups of pineapple juice, and some mango juice. Jill wants to make 2 times as much punch. How much mango juice will she need?

F $1\frac{15}{16}$ cups
G $3\frac{7}{8}$ cups
H $7\frac{3}{4}$ cups
J $8\frac{1}{2}$ cups

- 3** If 15 identical boxes of rice weigh 11.25 pounds, how much will 18 of those boxes weigh?

A 0.75 lb
B 7.5 lb
C 12.5 lb
D 13.5 lb

SPI 0606.2.4 (continued)

- 4** Three friends shared equally the cost of an overnight camping trip. They spent a total of \$55.90. The park entrance fee was \$15.50 and the campsite fee was \$12.86. The remaining of the total was spent on gas. What was each friend's share of the cost for gas?

F \$0.92
G \$8.36
H \$9.18
J \$27.54

- 5** On a flight from Basketville to Newmark, a plane averaged 537.35 miles per hour for 3 hours and 487.52 miles per hour for 2 hours. How far did the plane fly on this trip?

A 258.709 miles
B 1,024.87 miles
C 2,587.09 miles
D 6,370.1 miles

- 6** Tom has a rope that is $16\frac{1}{2}$ feet in length. He wants to cut it into pieces that are $2\frac{1}{2}$ feet long each. Then Tom wants to use some of the leftover rope to cut off a piece that is $\frac{2}{5}$ foot long. How much of the rope will be left after all the pieces are cut from it?

F $\frac{1}{5}$ foot
G $\frac{1}{4}$ foot
H $\frac{1}{2}$ foot
J $\frac{3}{5}$ foot

SPI 0606.2.5

Transform numbers from one form to another (fractions, decimals, percents, and mixed numbers).

- 1** Which fraction is equivalent to the decimal 6.023?

A $6\frac{23}{100}$
B $6\frac{23}{1,000}$
C $6\frac{23}{10,000}$
D Not here

- 2** A truck carried 0.8 tons of gravel. Which fraction also describes the amount of gravel on the truck?

F $\frac{8}{100}$
G $\frac{1}{8}$
H $\frac{2}{3}$
J $\frac{4}{5}$

- 3** Olivia got 57 out of 60 questions on the math test correct. What is her score expressed as a percent?

A 5%
B 57%
C 90%
D 95%

- 4** The scale shows the weight of Beth's dog in pounds.



Which is another way to describe this weight?

F $24\frac{3}{50}$ pounds
G $24\frac{1}{6}$ pounds
H $24\frac{3}{8}$ pounds
J $24\frac{3}{5}$ pounds

SPI 0606.2.5 (continued)

- 5** Which of these shows a set of equivalent numbers?

A 3.09, $3\frac{9}{10}$, 3.9%
B $2\frac{42}{50}$, 2.84, $2\frac{21}{25}$
C 8%, 0.8, $\frac{20}{25}$
D $\frac{16}{25}$, 32%, 0.64

- 6** In a survey, eighty people were asked to name their favorite sport. The results of the survey are shown in the table.

Sport	Number of People
Baseball	27
Football	45
Soccer	8

What percent of those surveyed chose football as their favorite sport?

F 5.625%
G 17.778%
H 45%
J 56.25%

- 7** During the championship baseball game, DeWayne hit the ball 12 times. Nine of those hits were foul balls. What percent of his hits were foul balls?

A 3%
B 12%
C 75%
D 120%

- 8** Three fifths of the players on Jake's football team are on the honor roll. What percent of the team is on the honor roll?

F 3.5%
G 35%
H 60%
J 70%

SPI 0606.2.6

Solve problems involving ratios, rates, and percents.

- 1** A bag contains 12 black marbles, 15 red marbles, and 8 green marbles. What is the ratio of black marbles to green marbles?

A 3:2
B 8:12
C 3:4
D 8:15

- 2** The ratio of boys to girls in Nelly's class is 3 to 4. If there are 9 boys in the class, how many students are in Nelly's class?

F 12
G 19
H 21
J 63

- 3** What is 2% of 750?

A 1.5
B 15
C 150
D 1,500

- 4** Wyatt's puppy gained 4 pounds in 5 months. Which shows the puppy's rate of weight gain?

F 0.2 pound per month
G 0.8 pound per month
H 1.25 pounds per month
J 4 pounds per month

SPI 0606.2.6 (continued)

- 5** Sandra earned \$57.75 for 7 hours of work. At this rate, how much will she earn for 9 hours of work?

A \$63
B \$66
C \$74.25
D \$519.75

- 6** A map uses a scale of 1 inch = 150 miles. On the map the distance between San Francisco, CA, and Reno, NV, is $1\frac{1}{2}$ inches. What is the actual distance between the cities?

F 100 mi
G 125 mi
H 150 mi
J 225 mi

- 7** A 12 ounce carton of milk costs \$.96, a 32 ounce carton costs \$2.24, and a 64 ounce carton costs \$4.16. What can you conclude?

A The 12 ounce carton is the best buy.
B The 32 ounce carton is the best buy.
C The 64 ounce carton is the best buy.
D Two 32 ounce cartons cost the same as one 64 ounce carton.

- 8** The students at South Middle School want to raise \$2,500 for new playground equipment at the elementary school. To date, they have raised \$1,700. What percent of their goal have they reached?

F 32%
G 45%
H 68%
J 75%

SPI 0606.2.6 (continued)

- 9** It takes Marcia 15 minutes to answer 9 questions on her quiz. At this rate, how long will it take Marcia to complete all 36 questions on her quiz?
- A** 30 min
B 45 min
C 50 min
D 60 min
- 10** Donny bought a fishing pole for \$24, after receiving a 20% discount. What was the original price of the fishing pole?
- F** \$19.20
G \$28.80
H \$30
J \$44
- 11** Nicole put \$750 into a savings account that earns 3% simple interest each year. How much interest will the money earn in 5 years?
- A** \$112.50
B \$765
C \$862.50
D \$1,125
- 12** If a package of 20 recordable CDs costs \$16, how much do 5 of the recordable CDs cost?
- F** \$4
G \$5
H \$8
J \$10

SPI 0606.2.6 (continued)

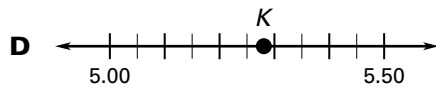
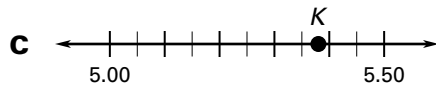
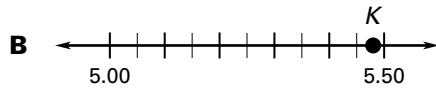
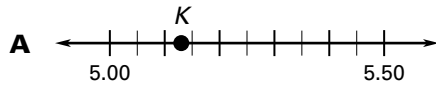
- 13** Jorge completed a 20 mile bike race in 1 hour and 20 minutes. What was his average speed?
- A** 10 mi/h
 - B** 15 mi/h
 - C** 24 mi/h
 - D** 63 mi/h
- 14** A honeybee can fly 15 miles in 1 hour. How many miles can it fly in 40 minutes?
- F** 4 miles
 - G** 5 miles
 - H** 6 miles
 - J** 10 miles

- 15** Ralph used 75% of his study time working on his research paper. If it took him 3 hours to work on his paper, how much time did Ralph have left to work on his science homework?
- A** 1 hour
 - B** 2 hours
 - C** 3 hours
 - D** 4 hours
- 16** Tarik left a 22% tip for the waitress who served his family. Without the tip, the bill for the meal was \$67.62. What was the total amount, including the tip, that Tarik paid?
- F** \$14.88
 - G** \$52.74
 - H** \$67.84
 - J** \$82.50

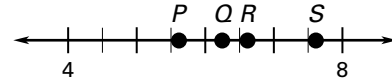
SPI 0606.2.7

Locate positive rational numbers on the number line.

- 1** Which number line shows Point *K* located closest to 5.28?



- 2** Which point on the number line is the closest to $6\frac{5}{8}$?



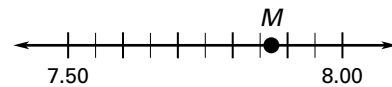
F Point *P*

G Point *Q*

H Point *R*

J Point *S*

- 3** Which number is most closely represented by Point *M* on the number line?



A 7.77

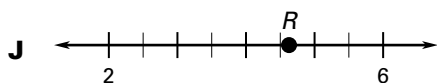
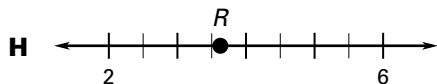
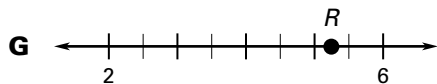
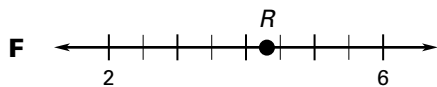
B 7.83

C 7.87

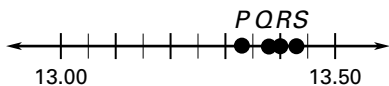
D 7.93

SPI 0606.2.7 (continued)

- 4** Which number line shows Point R located closest to $4\frac{3}{8}$?

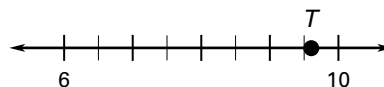


- 5** Which point on the number line is the closest to 13.43?



- A** Point P
B Point Q
C Point R
D Point S

- 6** Which number is most closely represented by Point T on the number line?



F $9\frac{1}{8}$

G $9\frac{1}{4}$

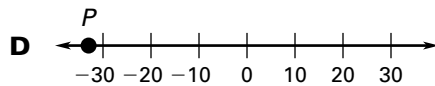
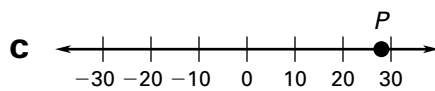
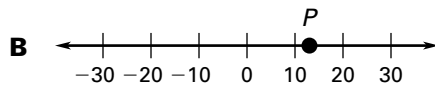
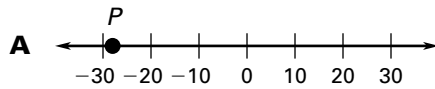
H $9\frac{5}{8}$

J $9\frac{7}{8}$

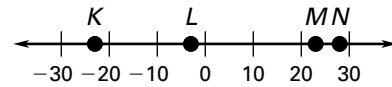
SPI 0606.2.8

Locate integers on the number line.

- 1** The Caspian Sea is 28 meters below sea level. Which number line best shows Point P at -28 ?



- 2** Which point on the number line is the closest to 23?



- F** Point K
G Point L
H Point M
J Point N

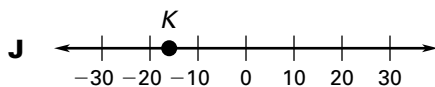
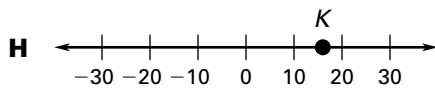
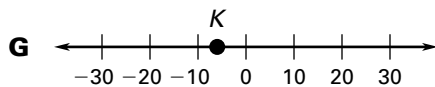
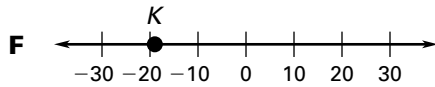
- 3** Which number is most closely represented by Point R on the number line?



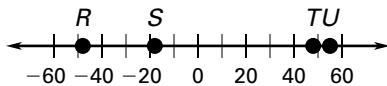
- A** -11
B -8
C -2
D 5

SPI 0606.2.8 (continued)

- 4** The temperature was -16°F today. Which number line best shows Point K at -16 ?

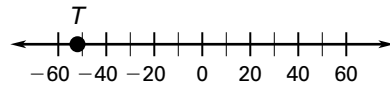


- 5** A balloon floated at a height of 48 feet. Which point on the number line is the closest to 48?



- A** Point R
B Point S
C Point T
D Point U

- 6** Which number is most closely represented by Point T on the number line?

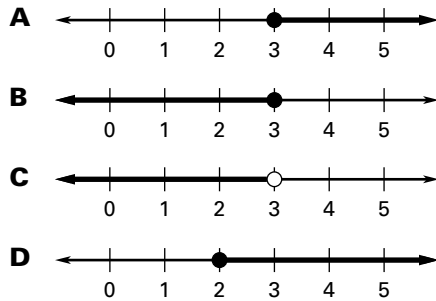


- F** -68
G -52
H -47
J -45

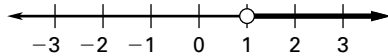
SPI 0606.3.1

Represent on a number line the solution of a linear inequality.

- 1** Which number line shows the solutions of $x - 2 \leq 1$?

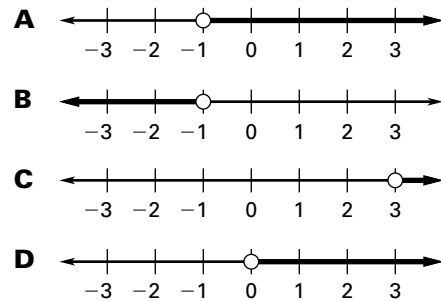


- 2** Which inequality has the solutions shown on the number line?



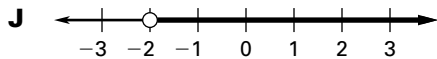
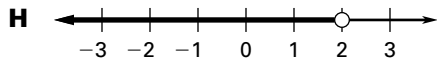
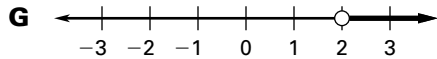
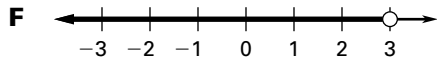
- F** $x + 1 > 2$
- G** $x - 1 > 2$
- H** $x + 2 < 3$
- J** $x - 2 < 3$

- 3** Which number line shows the solutions of $x + 2 > 1$?

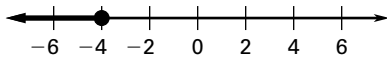


SPI 0606.3.1 (continued)

- 4** Which number line shows the solutions of $2x - 1 < 3$?

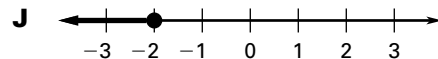
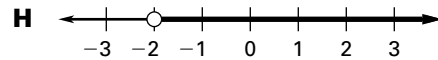
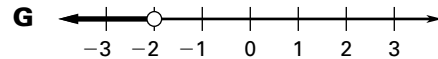
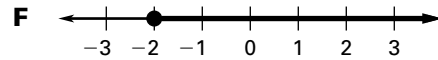


- 5** Which inequality has the solutions shown on the number line?



- A** $4x + 3 \geq 13$
B $-4x - 3 \geq 13$
C $3x + 5 \geq 13$
D $-3x - 5 \geq 13$

- 6** Which number line shows the solutions of $-3x + 3 \geq 9$?



SPI 0606.3.2

Use order of operations and parentheses to simplify expressions and solve problems.

- 1** According to the correct order of operations, which of these should be performed first to simplify this expression?

$$4^2 + 3 \times 2 + (8 - 2^2) \div 2$$

- A** $4^2 + 3$
- B** 3×2
- C** 4^2
- D** 2^2

- 2** What is the value of $5 + 9 \cdot 3$?

- F** 24
- G** 32
- H** 42
- J** 72

- 3** What is the simplest form of the expression below?

$$(4^2 + 3) + (5^2 \times 2^2)$$

- A** 17
- B** 51
- C** 119
- D** 149

- 4** Use order of operations to simplify.

$$2^3 + 8 \div 4$$

- F** 64
- G** 10
- H** 4
- J** 2.5

SPI 0606.3.2 (continued)

- 5** What is the simplest form of the expression below?

$$(3 + 3^2) - (16 \div 2^2)$$

- A** 5
B 8
C 16
D 32

- 6** What is the simplest form of the expression below?

$$(7^2 - 5^2) \div (2^3 + 4^2)$$

- F** 0
G $\frac{2}{7}$
H $\frac{1}{3}$
J 1

- 7** What is the value of $24 \div 8 \cdot 4^2 \div 2$?

- A** $\frac{3}{32}$
B 18
C 24
D 72

- 8** Use the order of operations to simplify the expression below.

$$24 + 2 \times (36 \div 9) - 5$$

- F** 27
G 35
H 56
J 99

SPI 0606.3.3

Write equations that correspond to given situations or represent a given mathematical relationship.

- 1** Which equation represents this sentence:
Five plus the quotient of a number and 6 equals 9.

A $5 + 6x = 9$
B $5 + \frac{x}{6} = 9$
C $5 + \frac{6}{x} = 9$
D $5 + x + 6 = 9$

- 2** Which equation represents this sentence:
Twenty-seven is equal to the sum of 3 and the product of 4 and a number n .

F $27 = 3n + 4$
G $27 = 3 + 4 + n$
H $27 = 3 + \frac{4}{n}$
J $27 = 3 + 4n$

- 3** The cost of renting a mountain bike is a basic fee of \$6 plus an additional \$2 for each hour that the bike is rented. Which equation can be used to find c , the cost of renting a bike for h hours?

A $c = 2(h + 6)$
B $c = 6(h + 2)$
C $c = 2h + 6$
D $c = 6h + 2$

- 4** Julia has \$100 in an account at school. She uses the account to pay for school lunch every day. Every day, \$4 is deducted from the account to pay for Julia's lunch. When the amount in the account is \$20, she likes to add money to it. Which equation can be used to determine how many days, d , she can buy lunch before adding more money to the account?

F $4d = 100$
G $4d - 20 = 100$
H $20 = 100 + 4d$
J $20 = 100 - 4d$

SPI 0606.3.3 (continued)

- 5** Maria bought 3 posters at the regular price of \$16 each. Then she got the same discount on each poster. Which equation can be used to find t , the total price of the 3 posters with the discount, d ?

A $t = 16 - d$
B $t = (3 \times 16) - d$
C $t = 3d + (3 \times 16)$
D $t = (3 \times 16) - 3d$

- 6** Which equation represents the following statement?

3 is 12 less than two times the number n .

F $3 = 12 - 2n$
G $3 = 2n - 12$
H $3 - 12 = 2n$
J $3 = 12(2n)$

- 7** It costs \$5 to get into an amusement park plus \$2 per ride, and Carter has \$80 to spend. Which equation can be used to find the number of rides n that he can afford?

A $5n + 2 = 80$
B $2n + 5 = 80$
C $7n + 80 = x$
D $5n + 80 + 2 = x$

- 8** Lydia wants to spend 90 hours at volleyball practice this year. She has already spent 30 hours. She plans to attend practice 6 hours a week for the rest of the year. Let w be the number of weeks in the rest of the year. Which equation describes the total number of hours Lydia will spend at volleyball practice this year?

F $30 + 6 = 90$
G $36w = 90$
H $36 + w = 90$
J $30 + 6w = 90$

SPI 0606.3.4

Rewrite expressions to represent quantities in different ways.

- 1** Which expression is equivalent to $8(n - 4) + 6$?

A $8n - 26$
B $8n - 38$
C $4n + 6$
D $4n - 2$

- 2** Which expression is equivalent to $3(y + 5) + 2y$?

F $5y + 5$
G $5y + 15$
H $9y + 15$
J $9y + 25$

- 3** Which expression is equivalent to $(6n - 4) - 5$?

A $2n - 5$
B $2n - 20$
C $6n - 9$
D $6n - 21$

SPI 0606.3.4 (continued)

- 4** Which expression is equivalent to $2(x + 6) + 3x$?

F $11x$
G $36x$
H $5x + 6$
J $5x + 12$

- 5** Which expression is equivalent to $5(4y + 8)$?

A $(5 \cdot 4)y + 8$
B $(5 \cdot 4 \cdot 8)y$
C $(5 \cdot 4) + (5 \cdot 4)y$
D $(5 \cdot 4)y + (5 \cdot 8)$

- 6** Which expression is equivalent to $4(x + y)$?

F $4xy$
G $4x + y$
H $4x + 4y$
J $x + 4y$

SPI 0606.3.5

Translate between verbal expressions/sentences and algebraic expressions/equations.

- 1** Which expression represents the phrase
the sum of twice a number and 7?

A $2 + n + 7$
B $n + 2(7)$
C $2n + 7$
D $2n(7)$

- 2** Write the phrase *6 less than the quotient of 4 and a number* as a variable expression.

F $4 - 6n$
G $6 - 4n$
H $\frac{4}{n} - 6$
J $6 - \frac{4}{n}$

- 3** Which expression represents the phrase
3 times the difference of 12 and y?

A $3(12 - y)$
B $3(y - 12)$
C $3 - (12 - y)$
D $3 - 12y$

SPI 0606.3.5 (continued)**4** Which phrase could represent $w - 6$?

- F** The sum of w and 6
- G** The sum of 6 and w
- H** The difference of w and 6
- J** The difference of 6 and w

5 Which phrase could represent $2m - 1$?

- A** The sum of two times a number and one
- B** Twice a number less than one
- C** Two more than a number less one
- D** One less than twice a number

6 Look at the expression below.

$$\frac{n}{6} + 10$$

Which of these has the same meaning as the expression?

- F** Ten more than the quotient of a number divided by six
- G** Ten more than the product of a number and six
- H** A number divided by the sum of six and ten
- J** Six divided by a number increased by ten

SPI 0606.3.6

Solve two-step linear equations using number sense, properties, and inverse operations.

- 1** What value of x makes this equation true?

$$5x + 16 = 41$$

- A** $x = 2$
- B** $x = 3$
- C** $x = 5$
- D** $x = 11.4$

- 2** What value of d makes $\frac{2}{5}d = 9$ true?

- F** 3.6
- G** 4.5
- H** 7
- J** 22.5

- 3** Look at the equation below

$$3x - 1 = 14$$

What value of x makes the equation true?

- A** 5
- B** 6
- C** 7
- D** 10

SPI 0606.3.6 (continued)

- 4** Look at the equation below

$$4y + 8 = 16$$

What value of y makes the equation true?

- F** 2
G 4
H 8
J 10

- 5** What value of x makes the equation

$$12 = 2 + \frac{x}{3} \text{ true?}$$

- A** 3
B 4
C 15
D 30

- 6** Look at the equation below

$$5x - 10 = 5$$

What value of x makes the equation true?

- F** 2
G 3
H 5
J 12

SPI 0606.3.6 (continued)

- 7** Look at the equation below

$$2x + 16 = 28$$

What value of x makes the equation true?

- A** 2
- B** 4
- C** 6
- D** 8

- 8** Look at the equation below

$$\frac{6}{n} = 3$$

What value of n makes the equation true?

- F** 2
- G** 3
- H** 9
- J** 12

- 9** Look at the equation below

$$6c - 19 = 23$$

What value of c makes the equation true?

- A** 4
- B** 7
- C** 13
- D** 17

SPI 0606.3.6 (continued)

10 $\frac{x}{4} + 19 = 27; x = ?$

- F** 8
G 12
H 16
J 32

11 What value of y makes the equation $8y + 22 = 78$ true?

- A** 4
B 7
C 13
D 17

12 $\frac{36}{x} = 4; x = ?$

- F** 4
G 9
H 12
J 32

SPI 0606.3.7

Use algebraic expressions and properties to analyze numeric and geometric patterns.

- 1** The table below shows values of x and y .

Input, x	Output, y
3	11
6	8
9	5
12	2

Which expression can be used to find any value of y in terms of x ?

- A** $14 - x$
B $10 - x$
C $x + 8$
D $x + 2$

- 2** The table below shows values of n and c .

n	1	2	3	4
c	7	12	17	22

Which expression can be used to find the value of c in terms of n ?

- F** $7n$
G $6n + 1$
H $10n - 3$
J $5n + 2$

- 3** The table below shows values of x and y .

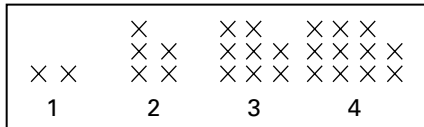
x	y
10	250
15	375
22	550
31	775

Which expression can be used to find the value of y in terms of x ?

- A** $25y$
B $25x$
C $x + 240$
D $\frac{25}{x}$

SPI 0606.3.7 (continued)

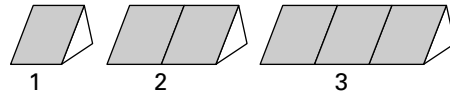
- 4**
- Look at the pattern of Xs.



Which expression can be used to find the number of Xs in the next term when n is the number of Xs in the previous term?

- F** $n + 2$
G $n + 3$
H $2n + 1$
J $3n - 1$

- 5**
- The pattern below shows three rows of triangular prisms. The number below each row tells how many faces can be seen in the row.



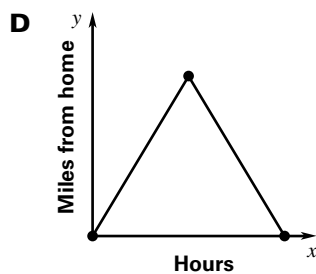
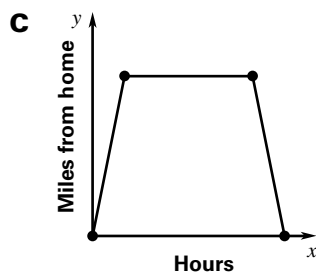
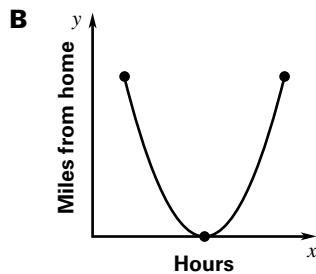
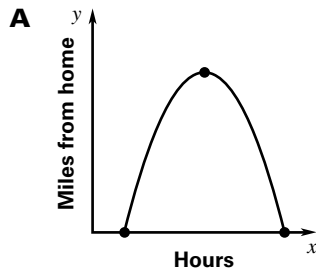
Which expression tells the number of faces on a row of triangular prisms in terms of the number of prisms (p) in the row?

- A** $p + 2$
B $p + 3$
C $2p + 3$
D $3p + 2$

SPI 0606.3.8

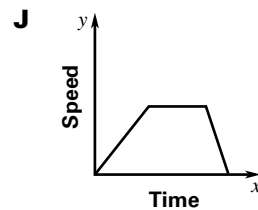
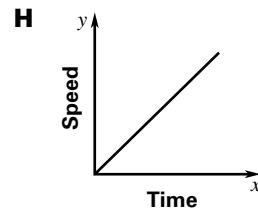
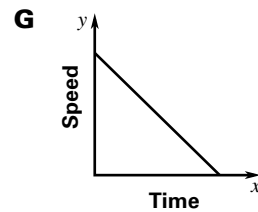
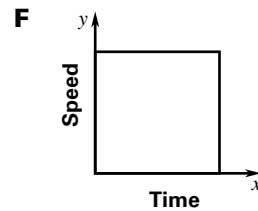
Select the qualitative graph that models a contextual situation (e.g., water filling then draining from a bathtub).

- 1** Julie rode her bike to the movie theater, watched the newest movie, then rode her bike home. Which graph best depicts Julie's trip?



- 2** An urban rail train pulls into a station and stops.

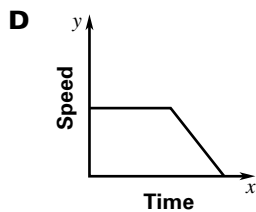
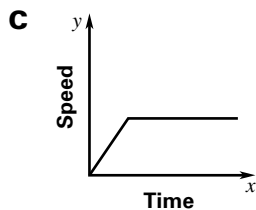
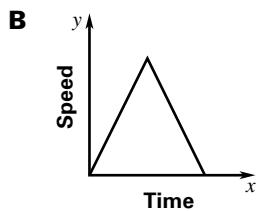
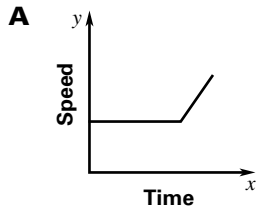
Which graph best represents this situation?



SPI 0606.3.8 (continued)

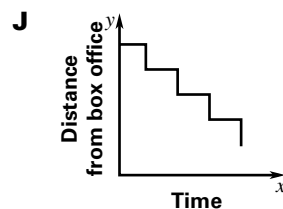
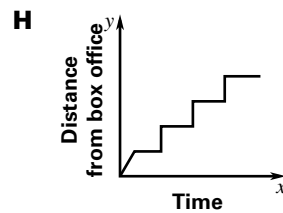
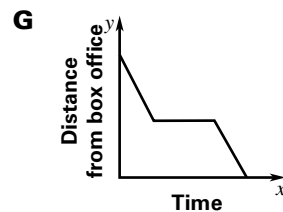
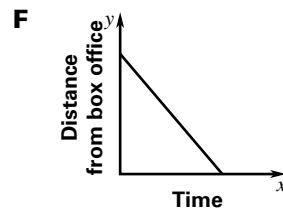
- 3** A dog walks around the yard at a steady pace. Then the dog runs to the fence.

Which graph best represents this situation?



- 4** A person waits in line to buy a movie ticket. Every time another person buys a ticket, the person moves closer to the box office.

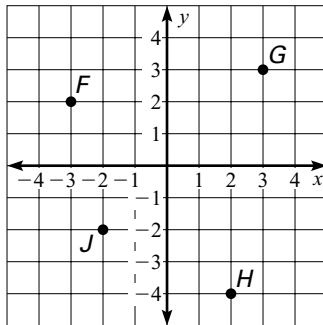
Which graph best represents this situation?



SPI 0606.3.9

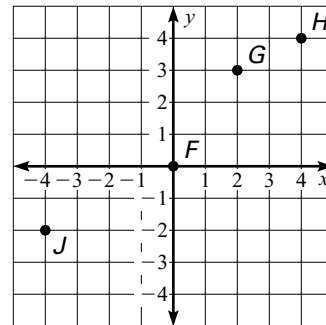
Graph ordered pairs of integers in all four quadrants of the Cartesian coordinate system.

- 1** Which point is located at $(2, -4)$?



- A** point F
- B** point G
- C** point H
- D** point J

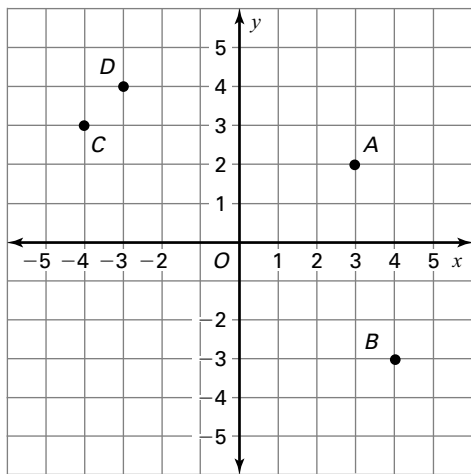
- 2** Which point is located at $(-4, -2)$?



- F** point F
- G** point G
- H** point H
- J** point J

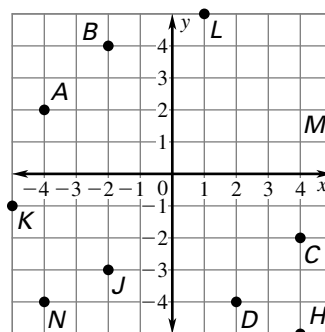
SPI 0606.3.9 (continued)

- 3** Which point is located at $(-4, 3)$?



- A** point *A*
B point *B*
C point *C*
D point *D*

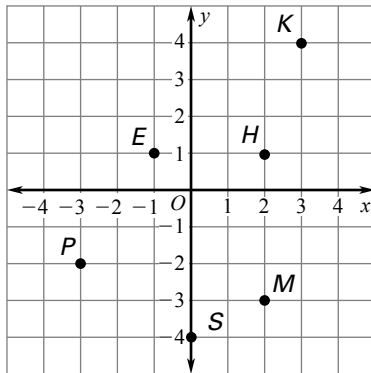
- 4** Which point has the coordinates $(-2, 4)$?



- F** point *A*
G point *B*
H point *C*
J point *D*

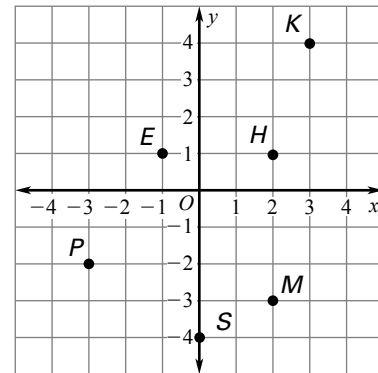
SPI 0606.3.9 (continued)

- 5** Which point is located at $(3, 4)$?



- A** point E
- B** point K
- C** point H
- D** point P

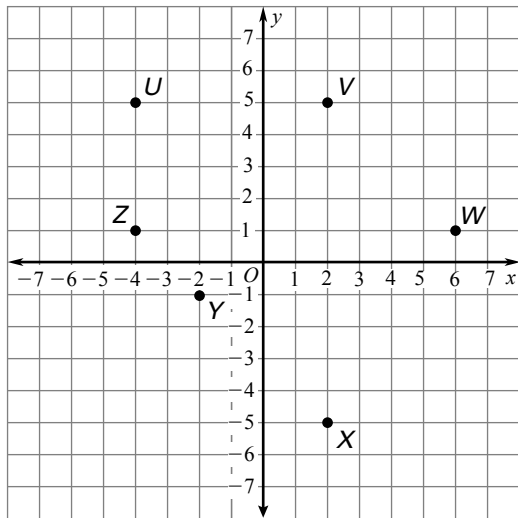
- 6** Which are the coordinates for point M ?



- F** $(2, 3)$
- G** $(-2, 3)$
- H** $(-2, -3)$
- J** $(2, -3)$

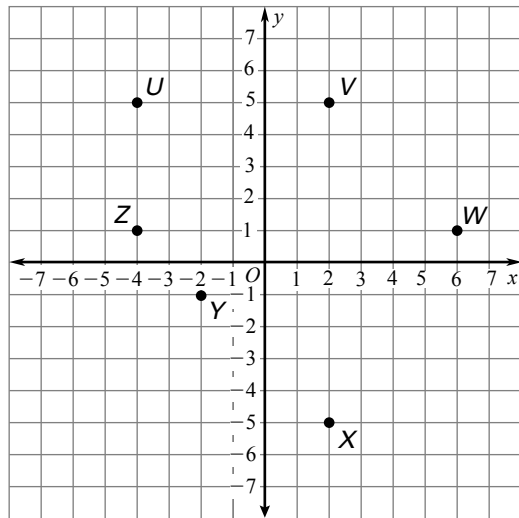
SPI 0606.3.9 (continued)

- 7** Which point is located at $(-2, -1)$?



- A** point U
- B** point V
- C** point Y
- D** point Z

- 8** Which are the coordinates for point W ?

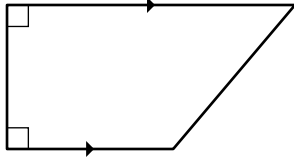


- F** $(6, 1)$
- G** $(1, 6)$
- H** $(-6, 1)$
- J** $(6, -1)$

SPI 0606.4.1

Identify, define or describe geometric shapes given a visual representation or a written description of its properties.

- 1** Which best classifies the quadrilateral below?



- A** parallelogram
- B** rhombus
- C** rectangle
- D** trapezoid

- 2** What type of triangle has angle measures of 32° , 89° , and 59° ?

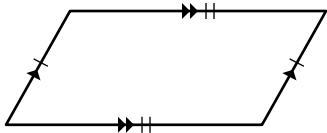
- F** acute
- G** regular
- H** obtuse
- J** right

- 3** Which of these three-dimensional figures has 6 faces, 8 vertices, and 12 edges?

- A** rectangular pyramid
- B** triangular pyramid
- C** cylinder
- D** cube

SPI 0606.4.1 (continued)

- 4** What type of quadrilateral is shown below?



- F** parallelogram
G rectangle
H rhombus
J square

- 5** What type of triangle has side lengths of 13 meters, 12 meters, and 24 meters?

- A** isosceles
B equilateral
C scalene
D right

- 6** Ricardo drew a picture of a three-dimensional figure. He made this chart to tell the number of faces, vertices, and edges for his figure.

Faces	Edges	Vertices
5	9	6

What three-dimensional figure did Ricardo draw?

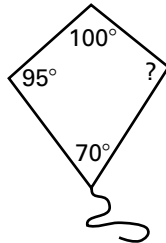
- F** triangular prism
G rectangular prism
H triangular pyramid
J rectangular pyramid

SPI 0606.4.2

Find a missing angle measure in problems involving interior/exterior angles and/or their sums.

- 1** What is the measure of the fourth angle in the figure below?

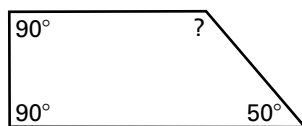
Dylan's Kite



- A** 80°
- B** 85°
- C** 95°
- D** 100°

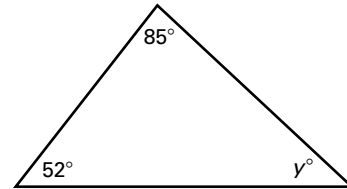
- 2** What is the measure of the fourth angle?

Brianna's Yard



- F** 130°
- G** 120°
- H** 90°
- J** 70°

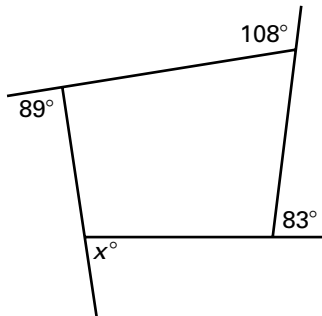
- 3** In the triangle below, what is the value of y ?



- A** 43°
- B** 47°
- C** 52°
- D** 85°

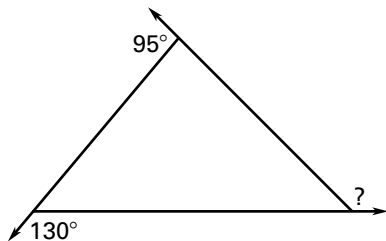
SPI 0606.4.2 (continued)

- 4** What is the measure of exterior angle x in the figure below?



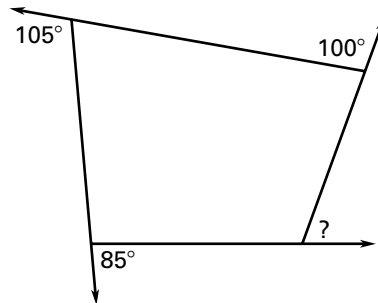
- F** 72°
G 80°
H 91°
J 100°

- 5** What is the measure of the exterior angle labeled with a question mark in the figure below?



- A** 35°
B 45°
C 135°
D 225°

- 6** What is the measure of the exterior angle labeled with a question mark in the figure below?

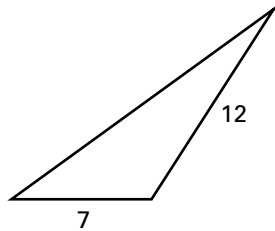


- F** 70°
G 75°
H 80°
J 95°

SPI 0606.4.3

Solve problems using the Triangle Inequality Theorem.

- 1** One side on the triangle measures 12 units. Another side measures 7 units.



Which could be the measure of the third side?

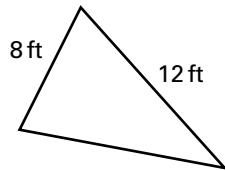
- A** 15
B 20
C 25
D 30
- 2** A triangle has sides that measure 12 feet and 16 feet. Which could be the measure of the third side?
- F** 2 feet
G 3 feet
H 4 feet
J 5 feet

- 3** A triangle has sides that measure 3 cm and 5 cm. Which could be the measure of the third side?

- A** 7 cm
B 8 cm
C 9 cm
D 10 cm

SPI 0606.4.3 (continued)

- 4** The figure shows the outline of a flower garden.



Which of the following is a possible measure for the third side of the garden?

- F** 4 ft
 - G** 8 ft
 - H** 20 ft
 - J** 24 ft
- 5** A triangle has sides that measure 5 yards and 9 yards. Which of the following could not be the measure of the third side?
- A** 15 yd
 - B** 13 yd
 - C** 10 yd
 - D** 8 yd

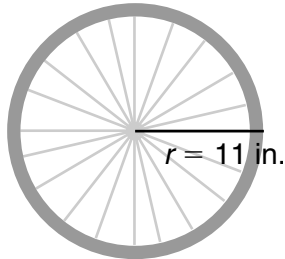
- 6** The first side of a triangle measures 14 inches, and the second side measures 16 inches. Which could be the measure of the third side of this triangle?

- F** 40 in.
- G** 35 in.
- H** 30 in.
- J** 27 in.

SPI 0606.4.4

Calculate with circumferences and areas of circles.

- 1** A bicycle tire has a radius of 11 inches. Which measurement is closest to the circumference of the tire? ($C = 2\pi r$, $\pi \approx 3.14$)



- A** 34 inches
- B** 50 inches
- C** 69 inches
- D** 76 inches

- 2** Which measurement is closest to the circumference of a circle with a radius of 3 centimeters? ($C = 2\pi r$, $\pi \approx 3.14$)

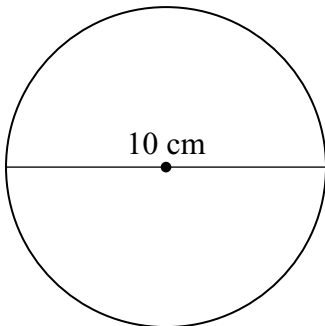
- F** 9.42 cm
- G** 18.84 cm
- H** 28.26 cm
- J** 138.16 cm

- 3** A circle has a radius of 18 yards. Which is closest to the circumference of the circle? ($C = 2\pi r$, $\pi \approx 3.14$)

- A** 34.54 yd
- B** 56.52 yd
- C** 87.92 yd
- D** 113.04 yd

SPI 0606.4.4 (continued)

- 4** A circle has a diameter of 10 centimeters. Which measurement is closest to the area of the circle? ($A = \pi r^2$, $\pi \approx 3.14$)



- F** 15.7 sq cm
G 31.4 sq cm
H 78.5 sq cm
J 157 sq cm
- 5** What is the area in square miles of a circle that has a diameter of 6 miles? ($A = \pi r^2$, $\pi \approx 3.14$)
- A** 18.84 mi²
B 28.26 mi²
C 37.68 mi²
D 113.04 mi²

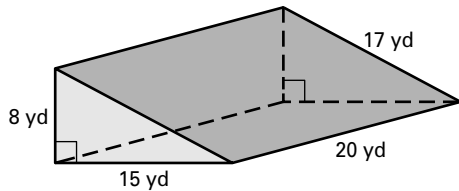
- 6** A circle has a diameter of 7 feet. Which measurement is closest to the area of the circle? ($A = \pi r^2$, $\pi \approx 3.14$)

- F** 10.99 ft²
G 21.98 ft²
H 38.47 ft²
J 153.86 ft²

SPI 0606.4.5

Determine the surface area and volume of prisms, pyramids, and cylinders.

- 1** What is the surface area of the prism?



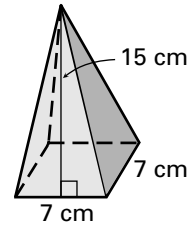
Surface Area = sum of the areas
of the faces

$$\text{Area of Rectangle} = lw$$

$$\text{Area of Triangle} = \frac{1}{2}bh$$

- A** 860 yd²
B 920 yd²
C 1,140 yd²
D 1,200 yd²

- 2** A container is shaped like the square pyramid below.



Surface Area = sum of the areas
of the faces

$$\text{Area of Square} = s \cdot s$$

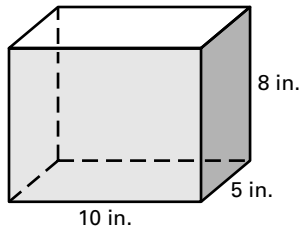
$$\text{Area of Triangle} = \frac{1}{2}bh$$

What is the total surface area of the package?

- F** 154 cm²
G 210 cm²
H 259 cm²
J 469 cm²

SPI 0606.4.5 (continued)

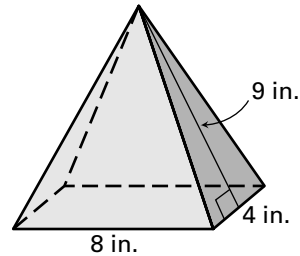
- 3** What is the surface area of the prism?



Surface Area = sum of the areas
of the faces
Area of Rectangle = lw

- A** 92 in.²
B 184 in.²
C 340 in.²
D 400 in.²

- 4** What is the surface area of the square pyramid?

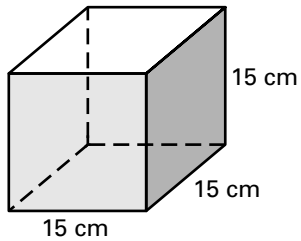


Surface Area = sum of the areas
of the faces
Area of Triangle = $\frac{1}{2}bh$
Area Rectangle = lw

- F** 50 in.²
G 54 in.²
H 104 in.²
J 136 in.²

SPI 0606.4.5 (continued)

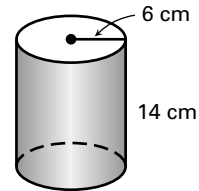
- 5** Emily is making a cube-shaped storage box in woodworking class.
(Volume of a cube = $s \cdot s \cdot s$)



What is the volume of the box?

- A** 3,375 cm^3
- B** 2,375 cm^3
- C** 225 cm^3
- D** 45 cm^3

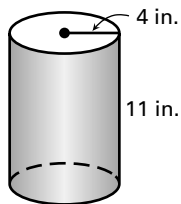
- 6** What is the volume of the cylinder shown below?
(Volume = $\pi r^2 h$, $\pi \approx 3.14$)



- F** 263.76 cm^3
- G** 527.52 cm^3
- H** 1,243.44 cm^3
- J** 1,582.56 cm^3

SPI 0606.4.5 (continued)

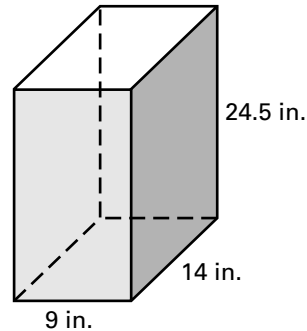
- 7** The cylinder below has a radius of 4 inches and a height of 11 inches.



Which is closest to the volume of the cylinder? (Volume of Cylinder = $\pi r^2 h$, $\pi \approx 3.14$)

- A** 138.16 in.³
- B** 276.32 in.³
- C** 552.64 in.³
- D** 1,519.76 in.³

- 8** Robert raises plants in a terrarium. The terrarium is 14 inches long, 9 inches wide, and 24.5 inches high.
(Volume of a rectangular prism = lwh)



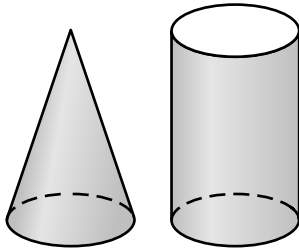
What is the volume of the terrarium?

- F** 216 in.³
- G** 343 in.³
- H** 3,087 in.³
- J** 3,150 in.³

SPI 0606.4.6

Given the volume of a cone/pyramid, find the volume of the related cylinder/prism or vice versa.

- 1** Both figures below have a height of 14 feet and a diameter of 6 feet.



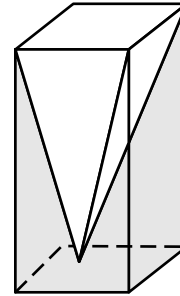
$$V(\text{cone}) = \frac{1}{3} Bh$$
$$V(\text{cylinder}) = Bh$$

B = Area of the base of the figure

The volume of the cone on the left is about 132 cubic centimeters. Which is closest to the volume of the cylinder?

- A** 44 cm³
- B** 264 cm³
- C** 396 cm³
- D** 528 cm³

- 2** A pyramid within a rectangular prism is shown below. The volume of the pyramid is 15 cubic yards.



$$V(\text{rectangular prism}) = Bh$$
$$V(\text{pyramid}) = \frac{1}{3} Bh$$

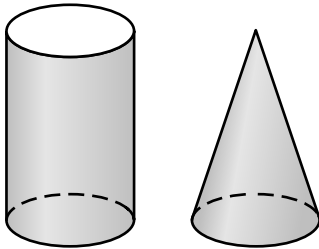
B = Area of the base of the figure

The pyramid and the prism have equal heights. The area of their bases is equal. What is the volume of the prism in cubic yards?

- F** 5 yd³
- G** 30 yd³
- H** 45 yd³
- J** 60 yd³

SPI 0606.4.6 (continued)

- 3** A cylinder and a cone are shown below.



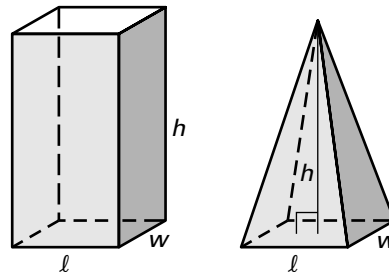
$$\begin{aligned} V(\text{cylinder}) &= Bh \\ V(\text{cone}) &= \frac{1}{3}Bh \\ B &= \text{Area of the base} \\ &\quad \text{of the figure} \end{aligned}$$

The volume of the cylinder is about 600 cubic inches. Which is closest to the volume of the cone?

- A** 100 cm³
B 200 cm³
C 900 cm³
D 1,200 cm³

- 4** A rectangular prism and a pyramid have the dimensions shown. If the volume of the prism is 96 cubic millimeters, what is the volume of the pyramid?

$$\begin{aligned} V(\text{rectangular prism}) &= Bh \\ V(\text{pyramid}) &= \frac{1}{3}Bh \\ B &= \text{Area of the base of} \\ &\quad \text{the figure} \end{aligned}$$



- F** 32 mm³
G 48 mm³
H 96 mm³
J 288 mm³

SPI 0606.5.1

Determine the theoretical probability of simple and compound events in familiar contexts.

- 1** Mike chooses a card at random from the letter cards shown below.

I	N	C	R	E	D	I	B	L	E
---	---	---	---	---	---	---	---	---	---

What is the probability the card chosen is a vowel?

A $\frac{1}{4}$

C $\frac{1}{2}$

B $\frac{2}{5}$

D $\frac{3}{5}$

- 2** Tyrone's aquarium has 8 neon tetras, 4 swordtails, and 6 zebra danios. What is the probability that a fish caught at random from the aquarium is a swordtail?

F $\frac{7}{9}$

H $\frac{2}{7}$

G $\frac{4}{9}$

J $\frac{2}{9}$

- 3** A large swimming pool has 2 slides, 3 diving boards, and a 1 vortex. Each is equally likely to be used next. What is the probability that the slide will be used next?

A $\frac{1}{6}$

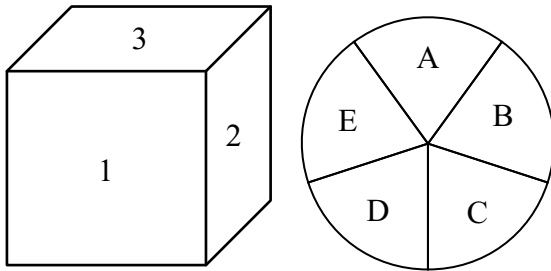
C $\frac{1}{2}$

B $\frac{1}{3}$

D $\frac{2}{3}$

SPI 0606.5.1 (continued)

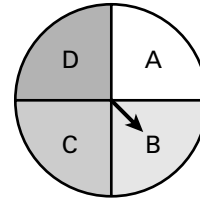
- 4** The number cube has faces labeled 1 through 6. The spinner has 5 equal sections labeled A through E.



What is the probability that the number cube will land on an even number and the spinner will land on a vowel?

- F** $\frac{2}{30}$ **H** $\frac{4}{30}$
G $\frac{3}{30}$ **J** $\frac{6}{30}$

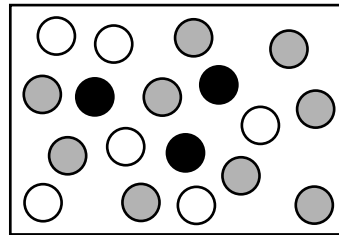
- 5** Miguel spins spinner below. Then he flips a coin.



What is the probability that the spinner stops on B and the coin lands on heads?

- A** $\frac{1}{8}$ **C** $\frac{3}{8}$
B $\frac{1}{4}$ **D** $\frac{3}{4}$

- 6** A box contains these marbles: 3 black, 6 white, and 9 red.



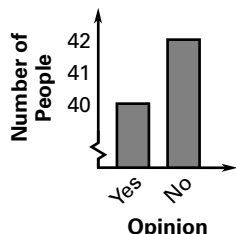
Tina picks two marbles at the same time without looking. What is the probability that she picks a red marble and a white marble?

- F** $\frac{1}{18}$ **H** $\frac{1}{5}$
G $\frac{1}{12}$ **J** $\frac{1}{6}$

SPI 0606.5.2

Identify features of graphs that may be misleading.

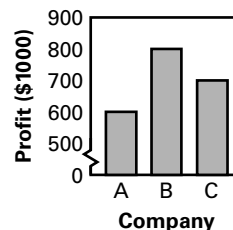
- 1** A poll asks 100 people if they support a new law. The results are shown below.



Margaret incorrectly says the survey shows that twice as many people support the law as oppose it. Which might have led her to this conclusion?

- A** The vertical axis is broken.
- B** The vertical axis is divided into increments that are too small.
- C** There is no bar to show undecided results.
- D** The values are hard to read.

- 2** The bar graph below shows one year's profits for three companies. Tim claims that the profits for company B were double those of company A.



How could the data display have led Tim to reach this incorrect conclusion?

- F** The scale exaggerates the differences.
- G** Other companies are not accounted for.
- H** The bar graph says nothing about profit.
- J** A circle graph would be more appropriate.

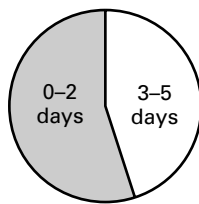
SPI 0606.5.2 (continued)

- 3** Cara tracked how often students used a new computer lab during the week. The results are shown below:

Not at all: 36% 1 day per week: 9%
2 days per week: 13% 3 days per week: 7%
4 days per week: 5% 5 days per week: 30%

Jamie made the circle graph below to show the results.

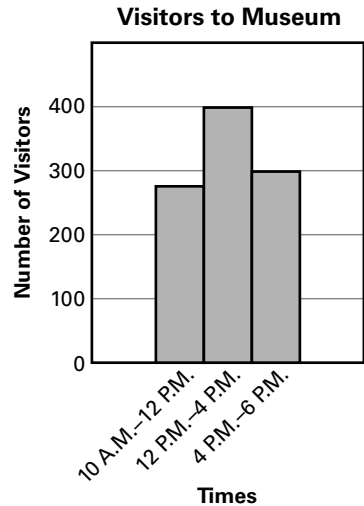
Computer Lab Use



Is the circle graph misleading? Explain.

- A** No; the graph is accurate.
- B** Yes; combining the data into two large groups hides the fact that “Not at all” was the most common response.
- C** Yes; the graph should treat “4 days per week” and “5 days per week” as separate categories.
- D** Yes; the graph should combine the groups into “Less than 5 days per week” and “5 days per week.”

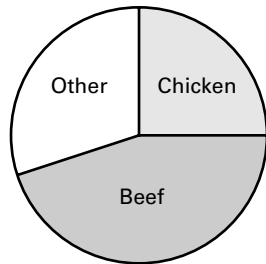
- 4** What feature of this graph may cause it to be misleading?



- F** The bars do not represent identical time spans.
- G** The intervals on the vertical scale are too large.
- H** The title is misleading.
- J** There is a broken vertical axis.

SPI 0606.5.2 (continued)

- 5** The graph below displays information about meat consumption in Texas.

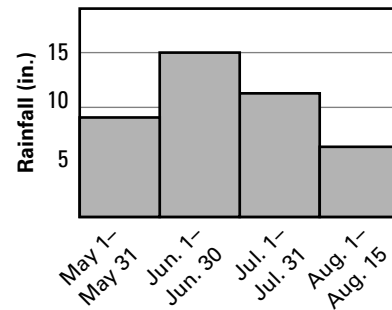


Which statement explains why the following claim may be inaccurate?

According to the information in the graph, chicken is the second most popular meat.

- A** The meats in the category “Other” are not named.
- B** One of the “Other” meats might be more popular than chicken.
- C** Beef and chicken are equally popular.
- D** There are no units of measurement.

- 6** A student looks at the graph and concludes that June is the wettest month.

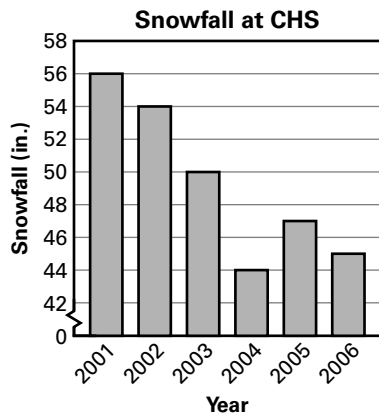


Why is this conclusion incorrect?

- F** One of the bars does not represent a full month.
- G** The scale for inches of rain does not go high enough.
- H** The intervals are too large.
- J** The vertical bars are too narrow.

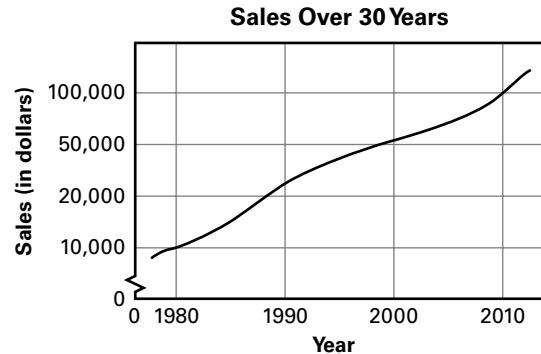
SPI 0606.5.2 (continued)

- 7** A student looks at the graph below and claims that the amount of snowfall in 2001 was about 4 times the amount in 2004. Why might the graph give this impression?



- A** The bars are too close together.
B It has a broken vertical axis.
C The graph only gives data for 6 years.
D It shows small intervals on the vertical axis.

- 8** What feature on this graph is the most misleading?



- F** The vertical scale is broken.
G The intervals on the scale are too large.
H The intervals on the scale are not the same.
J It does not tell why type of sales it represents.

SPI 0606.5.3

Determine whether or not a sample is biased.

1 A company wants to survey teenagers to find out if they have heard of the company's new clothing brand. Which sample group below is most likely to be biased?

- A** Teenagers from several different communities
- B** Teenagers of a wide range of ages
- C** Teenagers from different areas
- D** Teenagers who shop at a certain store

2 The movie club wants to know which movie to show during an after school program open to all students. Which sampling method will give the least biased sample?

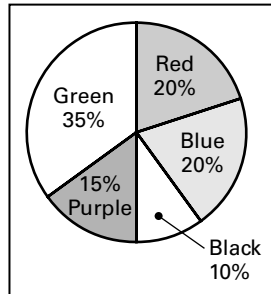
- F** Survey every teacher.
- G** Survey members of the drama club.
- H** Survey members of the football team.
- J** Survey students during the first lunch period.

SPI 0606.5.3 (continued)

- 3** Steven's school wants to find the average amount of time students exercise each day. Which sampling method gives the most representative sample of the student population?
- A** Randomly select 25 students at the bike racks.
 - B** Survey each student on the soccer and tennis teams.
 - C** Randomly select 50 students from 3 study halls.
 - D** Survey the first 40 students to attend a special elective gym class.
- 4** A doctor wants to know how long people spend waiting for their appointment. The doctor takes a survey every day for two weeks. Which sampling method is most likely to give biased results?
- F** Survey every 10th patient.
 - G** Survey the first 4 patients of the day.
 - H** Survey only patients who arrive late for their appointment.
 - J** Survey only patients who have appointments in the morning.

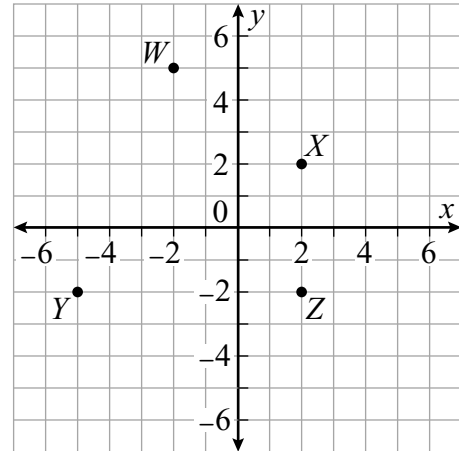
Post Test

- 1** The circle graph shows the results of a survey asking 60 randomly selected teenagers their favorite color. Suppose you surveyed an additional 50 randomly selected teenagers about their favorite colors. About how many teenagers would you predict would like red?



- A** 5
B 10
C 15
D 20

- 2** Which point best represents the ordered pair $(2, -2)$ on this coordinate graph?



- F** point *W*
G point *X*
H point *Y*
J point *Z*

- 3** Look at the equation below.

$$36 = 27 + \frac{s}{3}$$

What value of s makes the equation true?

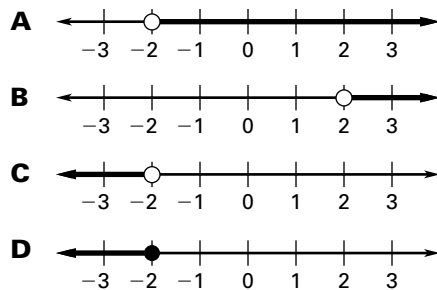
- A** 3
B 9
C 14
D 27

Post Test (continued)

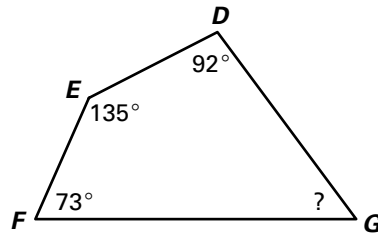
- 4** Which expression is equivalent to $4(n + 6) + 3n$?

F $13n$
G $27n$
H $7n + 6$
J $7n + 24$

- 5** Which number line shows solutions of $-3x + 1 > 7$?



- 6** What is the measure of angle G ?



F 107°
G 80°
H 70°
J 60°

- 7** Allen added the numbers 103.46, 116.2, 101.9, and 112.85. Why is 399.41 not a reasonable solution?

A The answer should not have two decimal places.
B Each of the four numbers is greater than 100, so the total will be greater than 400.
C The product of the four numbers is 399.41.
D The last digit must be 2.

PostTest (continued)

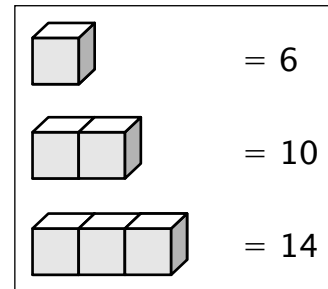
- 8** A circle had a diameter of 16 centimeters. Which measurement is closest to the area of the circle? (Use $A = \pi r^2$ and $\pi = 3.14$).

F 25.12 cm²
G 50.24 cm²
H 200.96 cm²
J 803.84 cm²

- 9** The bill for a group eating at a restaurant was \$38.80. The group gave the server 0.15 of the bill as a tip. How much was the tip to the nearest cent?

A \$0.23
B \$0.58
C \$2.33
D \$5.82

- 10** Look at the pattern of cubes. The number to the right of each row tells how many faces can be seen in the row.



Which expression can be used to find the number of faces seen on a row of cubes in terms of the number of cubes (n) in the row?

F $2n + 2$
G $2n + 4$
H $4n + 2$
J $4n + 4$

- 11** David is 3 times as old as his brother, plus 4 years. Which equation can be used to find David's age d when his brother is b years old?

A $d = b + (3 \cdot 4)$
B $d = 3b + 4$
C $d = 3b - 4$
D $d = b + 4$

Post Test (continued)

- 12** Which expression is equivalent to $15 = \frac{x}{3}$?

F $10 = 3x - 5$

G $10 = \frac{x}{3} - 5$

H $3x + 5 = 10$

J $\frac{x}{3} + 5 = 10$

- 13** Sandy lost $1\frac{1}{8}$ pounds training for basketball season. What is that number in decimal form?

A 0.125 pounds

B 1.1 pounds

C 1.125 pounds

D 1.2 pounds

- 14** To the nearest whole foot, what is the circumference of a circle with a diameter of 50 feet? (Use $C = \pi d$ and $\pi \approx 3.14$.)

F 80 ft

G 157 ft

H 257 ft

J 314 ft

- 15** Edgar just returned from skiing over winter vacation. One morning when Edgar woke up, the temperature was 10 degrees below zero. If the temperature went up 7 degrees by noon, what was the new temperature?

A -7°

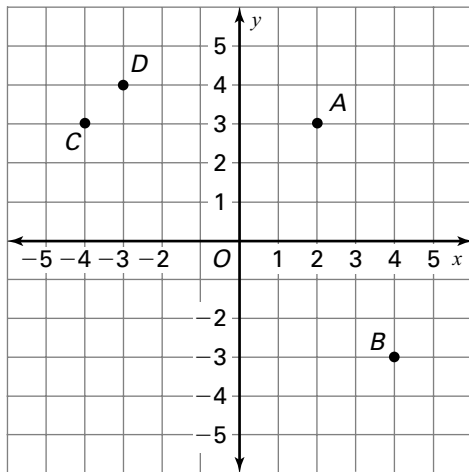
B -3°

C 3°

D 7°

PostTest (continued)

- 16** Which point best represents the ordered pair (2, 3) on this coordinate graph?



- F** point A
G point B
H point C
J point D

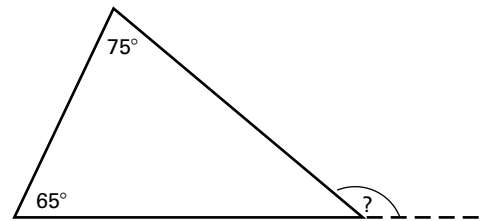
- 17** Janice followed the steps shown to rewrite an expression.

$$\begin{aligned} 4(x + 5) &= 4x + 20 \\ &= 20 + 4x \end{aligned}$$

Which properties did she use?

- A** associative and distributive
B associative and commutative
C distributive and commutative
D associative, distributive, and commutative

- 18** What is the measure of the exterior angle labeled “?” in the figure below?



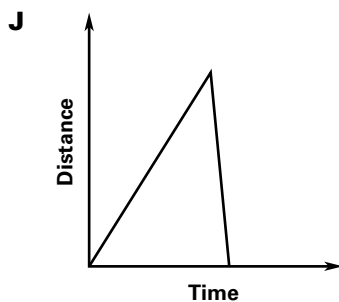
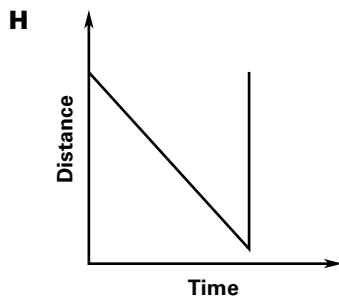
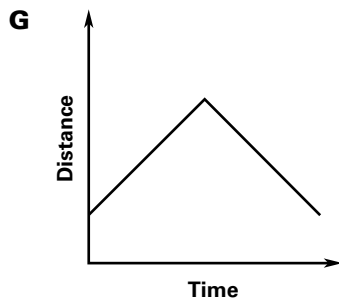
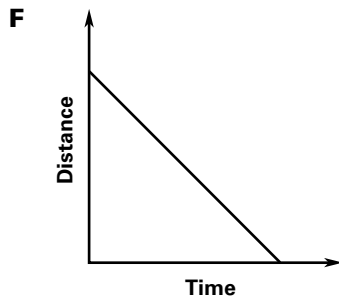
- F** 75°
G 105°
H 140°
J 320°

- 19** $\frac{3}{8} \div \frac{5}{12} =$

- A** $\frac{1}{10}$
B $\frac{5}{32}$
C $\frac{9}{10}$
D $6\frac{2}{5}$

Post Test (continued)

- 20** A roller coaster went up a hill. Then it went down the hill at a faster speed. Which graph best represents the speed of the roller coaster from the moment it starts up the hill until it reaches the bottom of hill?



- 21** Last year Matthew spent \$50 per month on gasoline for his car. This year he is spending \$75 per month. Which integer represents the change in gasoline costs each month?

A -75
B -25
C 25
D 75

- 22** Which expression represents the phrase *the quotient of a number and 6, increased by 10*?

F $\frac{n}{6 + 10}$
G $\frac{n}{6} + 10$
H $6n + 10$
J $\frac{6}{n} + 10$

- 23** Subtract 2.617 from 7.34.

A 1.883
B 4.723
C 4.737
D 9.957

Post Test (continued)

- 24** Which phrase best represents $3(x + 5)$?

F Three times a number
G Three times the difference of a number and five
H The sum of a number and five
J Three times the sum of a number and five

- 25** Ana made 6 gallons of punch for her party. People at the party drank $3\frac{1}{2}$ gallons of the punch. Then her little brother and his friends drank $1\frac{1}{4}$ gallons. How many gallons of punch did Ana have left

A $\frac{1}{4}$
B $1\frac{1}{4}$
C $3\frac{3}{4}$
D $4\frac{3}{4}$

- 26** Look at the equation below.

$$3y + 16 = 31$$

What value of y makes the equation true?

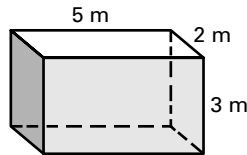
F 5
G 8
H 22
J 23

- 27** Alex surveyed the 25 students in his homeroom about the ages of their siblings. Only 2 students had siblings under the age of 5. At this rate, about how many of the 400 students in the school have siblings under the age of 5?

A 4
B 8
C 16
D 32

PostTest (continued)

- 28** What is the volume of the rectangular prism below?

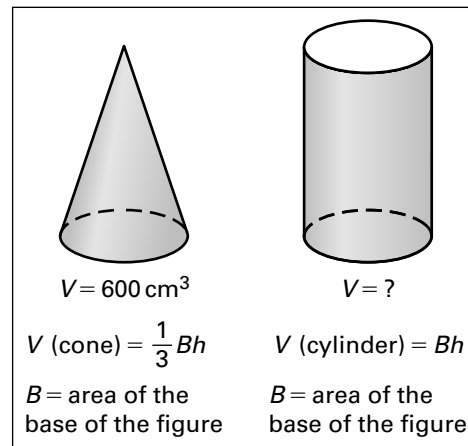


- F** 11 m^3
G 30 m^3
H 62 m^3
J 180 m^3

- 29** It took Clara 5 hours to drive 310 miles. At this speed, how long would it take her to drive 465 miles?

- A** 1.5 h
B 7.5 h
C 12 h
D 15 h

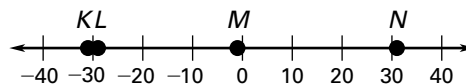
- 30** A cone and cylinder are shown below.



The cone and the cylinder have equal heights and bases of equal area. What is the approximate volume of the cylinder?

- F** 200 cm^3
G 900 cm^3
H $1,800 \text{ cm}^3$
J $2,400 \text{ cm}^3$

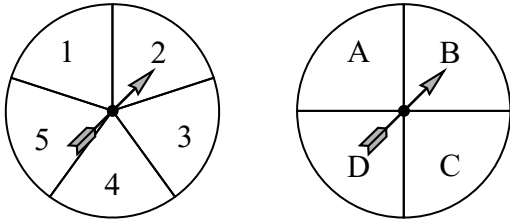
- 31** Which point on the number line is the closest to -31 ?



- A** Point *K*
B Point *L*
C Point *M*
D Point *N*

PostTest (continued)

- 32**
- A student spins these two spinners.



What is the probability that the student spins a 2 and a B?

- F** $\frac{1}{20}$
G $\frac{1}{16}$
H $\frac{1}{9}$
J $\frac{1}{8}$

- 33**
- George was involved in a swim-a-thon fundraiser. He contributed \$10 of his own money and his parents promised to pay him \$3 for every lap that he swam. Altogether, he raised \$97. Which equation can be used to find the number of laps,
- n
- , he swam?

- A** $97 = 3n$
B $10 = 97 + 3n$
C $3n - 97 = 10$
D $3n + 10 = 97$

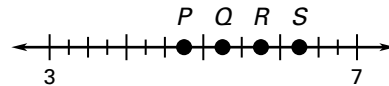
- 34**
- Look at the equation below.

$$3x + 4 = 22$$

What value of x makes the equation true?

- F** 2
G 3
H 4
J 6

- 35**
- Which point is closest to
- $5\frac{1}{4}$
- ?



- A** Point P
B Point Q
C Point R
D Point S

PostTest (continued)

- 36** A candidate for mayor wants to poll voters to see how well her campaign is doing. She plans to post signs asking people to call the pollsters with their opinions. Which best explains why the sample of people who call the pollsters may be biased?

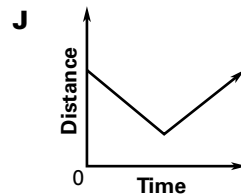
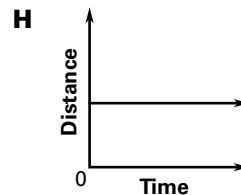
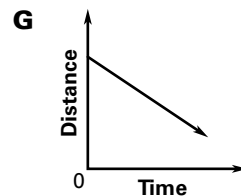
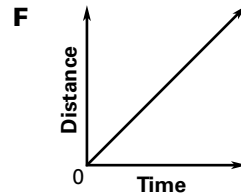
F Callers may not tell the truth.
G The responders are unlikely to be a random sample of voters.
H There may be too many female callers.
J People may not see the signs.

- 37** Insert parentheses to make this number sentence true.

$$20 \div 5 \times 2 + 3 = 5$$

- A** $(20 \div 5) \times 2 + 3 = 5$
B $20 \div (5 \times 2) + 3 = 5$
C $20 \div 5 \times (2 + 3) = 5$
D $20 \div (5 \times 2 + 3) = 5$

- 38** Matt walked to the store from his home. Which graph could show the relationship between the time he walked and his distance from home?

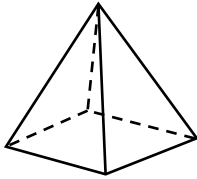
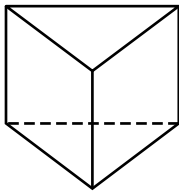
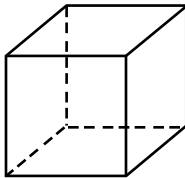
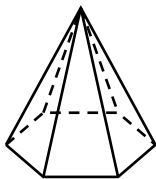


- 39** Subtract $19\frac{1}{2} - 11\frac{1}{3} =$

- A** $8\frac{1}{6}$
B $8\frac{1}{2}$
C 9
D $9\frac{1}{6}$

PostTest (continued)

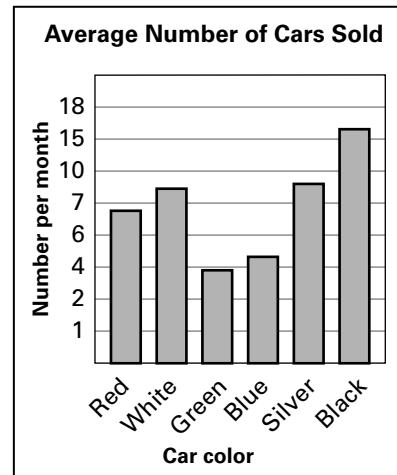
- 40** Which of these three-dimensional figures has two triangular faces and three rectangular faces?

F**G****H****J**

- 41** Which equation below represents the commutative property?

- A** $9 + 0 = 9$
B $9 + 3 = 3 + 9$
C $(9 + 3) + 4 = 9 + (3 + 4)$
D $9(3 + 4) = (9 \cdot 3) + (9 \cdot 4)$

- 42** The bar graph below shows the average number of cars of various colors sold by a dealership per month.



Which statement best explains why a person reading the graph might get an incorrect idea about the differences in the sales of cars of each color?

- F** The title of the graph is misleading.
G The horizontal scale does not show every possible color of car.
H The intervals on the vertical scale are not consistent.
J Not every possible car color is included.

PostTest (continued)

- 43** Juanita bought some pants for \$34.49 and 3 equally-priced T-shirts. She spent a total of \$53.66, not including tax. What was the price of each T-shirt?

A \$6.39
B \$19.17
C \$28.10
D \$34.49

- 44** Which expression best represents the y values in terms of the x values?

x	12	14	16	18	20
y	6	7	8	9	10

F $y - 2$
G $x - 2$
H $x \div 2$
J $y \div 2$

- 45** About 48% of the students at Highland Middle School buy lunch. There are 402 students at the school, and each lunch costs \$2.95. Which of the following is the best estimate of the total amount spent on lunches each day?



A \$50
B \$200
C \$400
D \$600

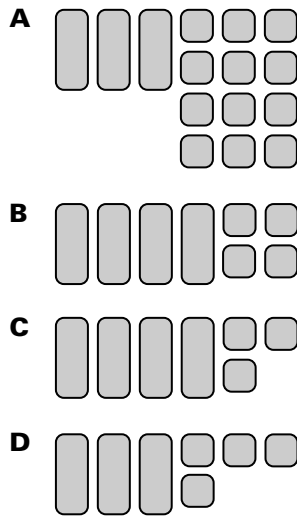
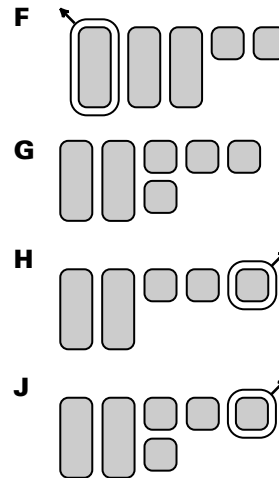
- 46** Which expression represents the phrase *5 times the sum of a number and 8*?

F $5x + 8$
G $13x$
H $5(x + 8)$
J $8(x + 5)$

Post Test (continued)

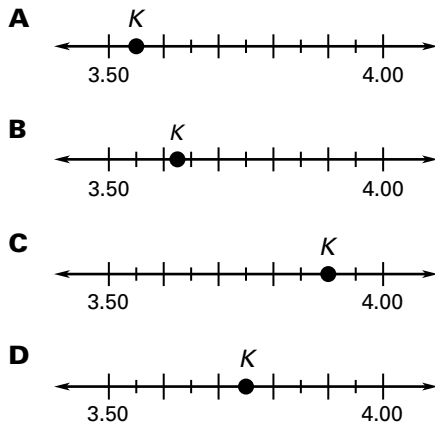
For questions 47 and 48, use the key below.

Key	
	= 1
	= x

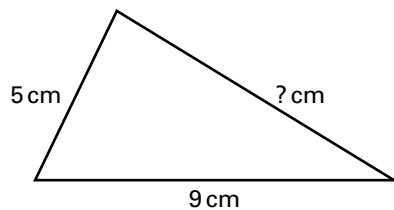
47 Which model below represents $3x + 4$?**48** Which model below represents $(2x + 3) - 1$?

Post Test (continued)

- 49** Which number line shows Point K located closest to 3.75?



- 50** Which could be the measure of the third side in the triangle below?



- F** 8 cm
G 14 cm
H 13 cm
J 16 cm

- 51** Abigail divides $\frac{3}{4}$ of a watermelon evenly among 12 people. What fraction of the watermelon did each person receive?

- A** $\frac{1}{16}$
B $\frac{1}{9}$
C 9
D 16

Post Test (continued)

- 52** Which of these three-dimensional figures has 6 faces, 8 vertices, and 12 edges?

F rectangular pyramid
G triangular pyramid
H cylinder
J cube

- 53** It took Stephen $3\frac{1}{2}$ hours to do the yardwork. He spent $\frac{2}{3}$ of that time mowing the grass. How long did it take Stephen to mow the grass?

A $1\frac{2}{3}$ hours
B 2 hours
C $2\frac{1}{3}$ hours
D $5\frac{1}{4}$ hours

- 54** The yearbook committee wants to know whether students think there should be more pages in the music section. Which method of sampling is least likely to produce a biased sample?

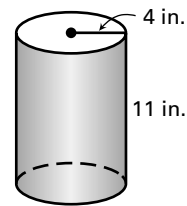
F Survey 50 students in the lunch line.
G Have each student working on the music section of the yearbook survey 10 friends.
H Survey students in the school chorus.
J Survey students performing in the school musical.

Post Test (continued)

- 55** What measurement is equivalent to 5.08 miles?

A $5\frac{2}{25}$ miles
B $5\frac{4}{25}$ miles
C $5\frac{1}{5}$ miles
D $5\frac{4}{5}$ miles

- 56** What is the surface area of the cylinder below? ($\pi = 3.14$)



Surface Area = sum of the area of the faces

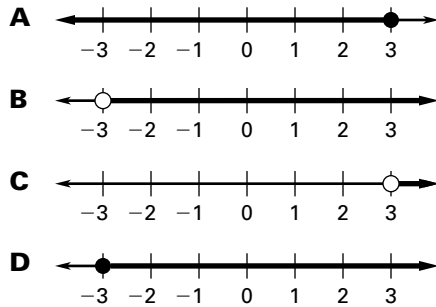
Area of a circle = πr^2

Area curved surface = bh ,
where b is the circumference of the circular base, or $2\pi r$

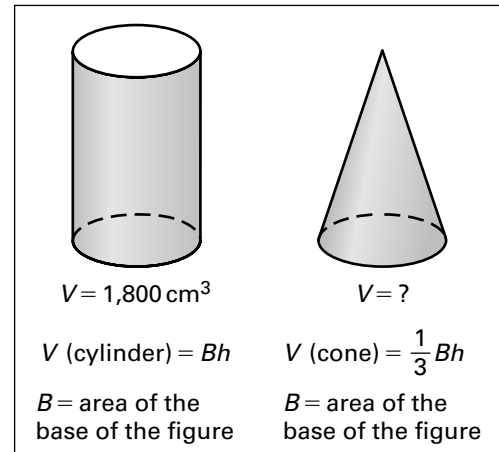
F 182.16 in.²
G 188.4 in.²
H 376.8 in.²
J 1,105.28 in.²

PostTest (continued)

- 57** Which number line shows solutions of $x + 5 \geq 2$?



- 58** A cylinder and cone are shown below.

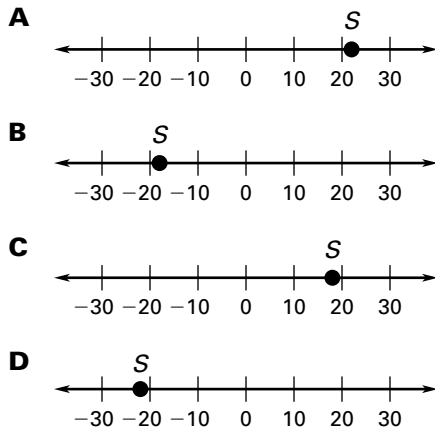


The cylinder and the cone have equal heights and bases of equal area. What is the approximate volume of the cone?

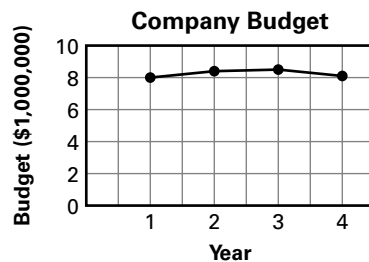
- F** 200 cm^3
- G** 300 cm^3
- H** 600 cm^3
- J** $3,600 \text{ cm}^3$

Post Test (continued)

- 59** A SCUBA diver dove to 22 feet below sea level. Which number line best shows Point S at -22 ?



- 60** The graph below shows a company's budget in millions of dollars during each of the last four years.



An employee claims that the budget did not change much during these years. How does the graph create this impression?

- F** It has a broken vertical axis.
- G** It only shows four years.
- H** It has large intervals on the vertical axis.
- J** It has small intervals on the horizontal axis.

Post Test (continued)

- 61** Logan paid \$7.50 for a new photo album after receiving a 25% discount. What was the original price of the photo album?

A \$8
B \$10
C \$25
D \$30

- 62** The first side of a triangle measures 6 centimeters. The second side measures 9 centimeters. Which could be the measure of the third side of the triangle?

F 10 cm
G 15 cm
H 17 cm
J 18 cm

Post Test (continued)

63 What is the value of
 $20 \div 4 \cdot 2 \div (10 - 8)$?

- A** -7
- B** $\frac{1}{8}$
- C** 1.25
- D** 5

64 Jennifer is assigned a whole number at random from the numbers 0–8 for a game at a summer camp. What is the probability that the number she is assigned is an even number?

- F** $\frac{4}{9}$
- G** $\frac{1}{2}$
- H** $\frac{5}{8}$
- J** $\frac{5}{9}$

PreTest**Fill in the correct answer**

1. (A) (B) (C) (D)
2. (F) (G) (H) (J)
3. (A) (B) (C) (D)
4. (F) (G) (H) (J)
5. (A) (B) (C) (D)
6. (F) (G) (H) (J)
7. (A) (B) (C) (D)
8. (F) (G) (H) (J)
9. (A) (B) (C) (D)
10. (F) (G) (H) (J)
11. (A) (B) (C) (D)
12. (F) (G) (H) (J)
13. (A) (B) (C) (D)
14. (F) (G) (H) (J)
15. (A) (B) (C) (D)
16. (F) (G) (H) (J)
17. (A) (B) (C) (D)
18. (F) (G) (H) (J)
19. (A) (B) (C) (D)
20. (F) (G) (H) (J)
21. (A) (B) (C) (D)
22. (F) (G) (H) (J)
23. (A) (B) (C) (D)
24. (F) (G) (H) (J)
25. (A) (B) (C) (D)

26. (F) (G) (H) (J)
27. (A) (B) (C) (D)
28. (F) (G) (H) (J)
29. (A) (B) (C) (D)
30. (F) (G) (H) (J)
31. (A) (B) (C) (D)
32. (F) (G) (H) (J)
33. (A) (B) (C) (D)
34. (F) (G) (H) (J)
35. (A) (B) (C) (D)
36. (F) (G) (H) (J)
37. (A) (B) (C) (D)
38. (F) (G) (H) (J)
39. (A) (B) (C) (D)
40. (F) (G) (H) (J)
41. (A) (B) (C) (D)
42. (F) (G) (H) (J)
43. (A) (B) (C) (D)
44. (F) (G) (H) (J)
45. (A) (B) (C) (D)
46. (F) (G) (H) (J)
47. (A) (B) (C) (D)
48. (F) (G) (H) (J)
49. (A) (B) (C) (D)
50. (F) (G) (H) (J)

51. (A) (B) (C) (D)
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56. (F) (G) (H) (J)
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58. (F) (G) (H) (J)
59. (A) (B) (C) (D)
60. (F) (G) (H) (J)
61. (A) (B) (C) (D)
62. (F) (G) (H) (J)
63. (A) (B) (C) (D)
64. (F) (G) (H) (J)

PostTest**Fill in the correct answer**

1. (A) (B) (C) (D)
2. (F) (G) (H) (J)
3. (A) (B) (C) (D)
4. (F) (G) (H) (J)
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14. (F) (G) (H) (J)
15. (A) (B) (C) (D)
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20. (F) (G) (H) (J)
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31. (A) (B) (C) (D)
32. (F) (G) (H) (J)
33. (A) (B) (C) (D)
34. (F) (G) (H) (J)
35. (A) (B) (C) (D)
36. (F) (G) (H) (J)
37. (A) (B) (C) (D)
38. (F) (G) (H) (J)
39. (A) (B) (C) (D)
40. (F) (G) (H) (J)
41. (A) (B) (C) (D)
42. (F) (G) (H) (J)
43. (A) (B) (C) (D)
44. (F) (G) (H) (J)
45. (A) (B) (C) (D)
46. (F) (G) (H) (J)
47. (A) (B) (C) (D)
48. (F) (G) (H) (J)
49. (A) (B) (C) (D)
50. (F) (G) (H) (J)

51. (A) (B) (C) (D)
52. (F) (G) (H) (J)
53. (A) (B) (C) (D)
54. (F) (G) (H) (J)
55. (A) (B) (C) (D)
56. (F) (G) (H) (J)
57. (A) (B) (C) (D)
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