VIRGINIA STANDARDS OF LEARNING

Released Test

GRADE 6

MATHEMATICS

2009 Mathematics Standards of Learning

Released Spring 2014

Property of the Virginia Department of Education

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Items 1 through 7 are in the non-calculator section of the test.

Items 8 through 50 are in the calculator section of the test.

SAMPLE A

The first four terms of a sequence are shown.

9, 12, 15, 18, . . .

What is the next term in this sequence?

- **A** 21
- **B** 27
- **C** 33
- **D** 54

Directions: Type your answer in the box. Your answer must be in the form of an improper fraction. Use "/" for the fraction bar.

SAMPLE B

What is the value of $\frac{2^2-1}{2}$?

Your answer must be in the form of an improper fraction.

Which of these numbers is between $\frac{1}{3}$ and $\frac{87}{100}$ on a number line?

$\frac{1}{3}$, —, $\frac{87}{100}$

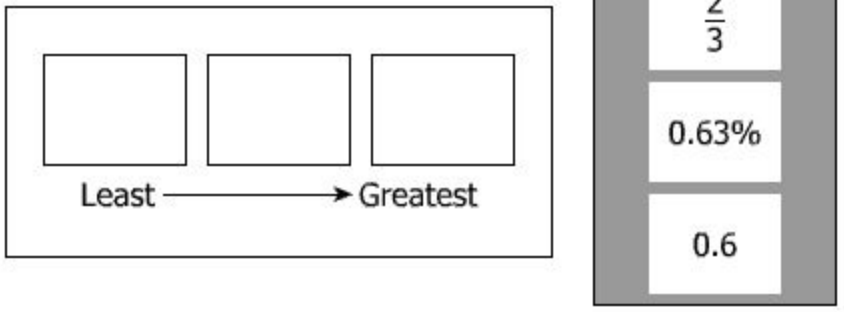
- A $\frac{3}{5}$
- B $\frac{3}{10}$
- C $\frac{92}{10}$
- D $\frac{11}{100}$

Which statement is true?

- **A** $\frac{2}{5} = 0.4$
- **B** $20\% = \frac{1}{20}$
- **C** $0.3\% = 0.03$
- **D** $8.6 = 0.086\%$

Directions: Click and drag each selected number to the correct box.

List the numbers in order from least to greatest.



Numbers

$\frac{2}{3}$

0.63%

0.6

What is the value of $7^2 - 4 + 5$?

- **A** 50
- **B** 40
- **C** 15
- **D** 14

$1\frac{7}{8} \div 3 =$?

- A $\frac{7}{24}$
- B $\frac{5}{8}$
- C $3\frac{7}{24}$
- D $5\frac{5}{8}$

What is the value of $6 + 3 \cdot 2$?

- **A** 36
- **B** 18
- **C** 12
- **D** 11

What is $3\frac{1}{2} \cdot 1\frac{1}{4}$?

- A $2\frac{4}{5}$
- B $3\frac{1}{8}$
- C $4\frac{3}{8}$
- D $5\frac{5}{6}$

The non-calculator section of the test ends here.

A bag contains red apples and yellow apples. The ratio of red apples to yellow apples in the bag is 9 to 4. Which of these statements could be true?

- **A** There are exactly 6 red apples and 1 yellow apple in the bag.
- **B** There are exactly 18 red apples and 8 yellow apples in the bag.
- **C** There are exactly 4 red apples and 9 yellow apples in the bag.
- **D** There are exactly 9 red apples and 13 yellow apples in the bag.

Which of these is an integer?

- **A** $\frac{7}{10}$
- **B** 6.5
- **C** -12
- **D** $-2\frac{3}{8}$

Which ratio correctly represents 0.1% ?

- **A** $\frac{1}{1}$
- **B** $\frac{1}{10}$
- **C** $\frac{1}{100}$
- **D** $\frac{1}{1,000}$

Which of these lists the numbers in order from least to greatest?

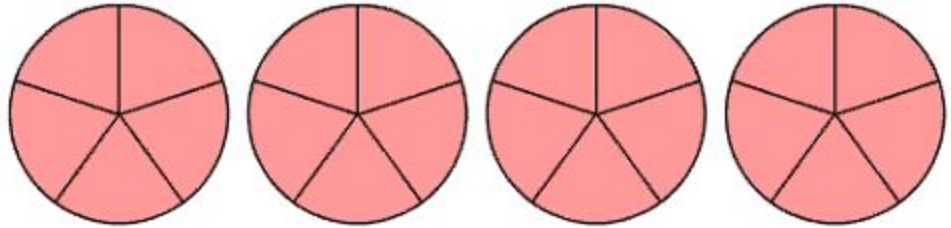
- **A** 3, $^{-}16$, 47
- **B** $^{-}16$, 3, 47
- **C** 3, 47, $^{-}16$
- **D** $^{-}16$, 47, 3

Directions: Click on all the correct answers.

Identify each statement that is true.

$^{-}5 > {}^{-}8$	$^{-}1 \leq {}^{-}6$
$^{-}7 \geq {}^{-}4$	$3 < {}^{-}9$
$^{-}3 > 2$	$10 \geq 8$

This picture represents 4 pizzas.



Exactly how many $\frac{2}{5}$ are in 4 ?

- **A** 2
- **B** 5
- **C** 10
- **D** 20

Valerie wrote the values of the powers of 3 that she knew.

$$3^1 = 3$$
$$3^2 = 9$$
$$3^3 = 27$$
$$3^4 = 81$$
$$3^5 = ?$$

What is the value of 3^5 ?

- **A** 15
- **B** 84
- **C** 125
- **D** 243

Samuel bought 4 rolls of tape to seal boxes. Each roll contains 32.9 meters of tape. He uses 1.2 meters of this tape to seal each box. What is the total number of boxes Samuel can seal with these 4 rolls of tape?

- **A** 109 boxes
- **B** 130 boxes
- **C** 132 boxes
- **D** 157 boxes

Mia is working on projects that require $3\frac{1}{2}$ yards of ribbon per project. Mia has 28 yards of ribbon. What is the greatest number of projects that Mia can complete with this ribbon?

- **A** 98
- **B** $31\frac{1}{2}$
- **C** $24\frac{1}{2}$
- **D** 8

Kevin threw a football $19\frac{2}{3}$ yards. Scott threw the football $24\frac{1}{3}$ yards. Which statement is true?

- **A** Kevin threw the football $4\frac{2}{3}$ yards farther than Scott.
- **B** Scott threw the football $4\frac{2}{3}$ yards farther than Kevin.
- **C** Kevin threw the football $5\frac{1}{3}$ yards farther than Scott.
- **D** Scott threw the football $5\frac{1}{3}$ yards farther than Kevin.

Alisha wants to buy a camera that costs $228, including tax. She has saved $4.75 each week for the past 8 weeks. How much more money does Alisha need to purchase the camera?

- **A** $6
- **B** $38
- **C** $48
- **D** $190

Directions: Type your answer in the box.

The regular price of a meal is $6.75. On Tuesday, the meal is on sale for $1.00 off the regular price. Sarah bought 4 of these meals on Tuesday. What is the total cost of these 4 meals before tax?

$ _____

Directions: Click and drag each selected temperature to the correct box.

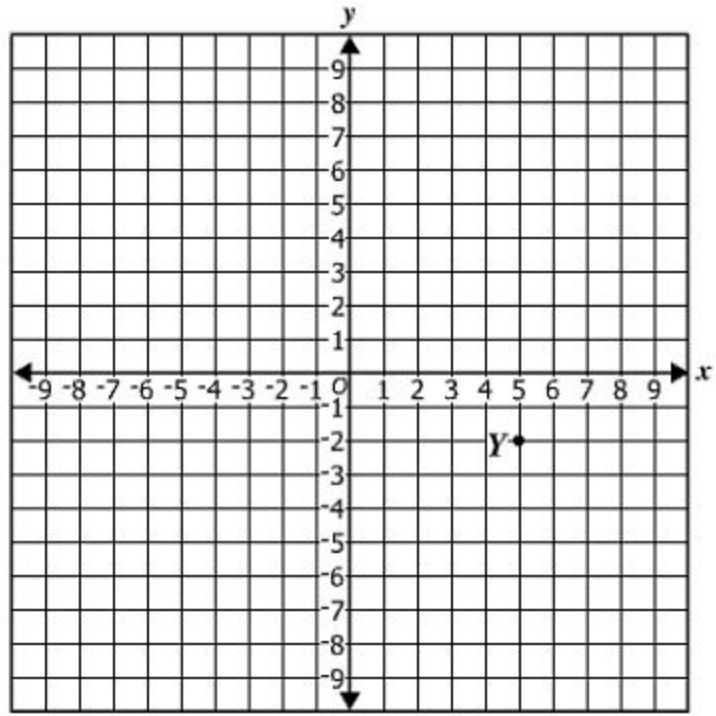
Use the given temperatures to make each statement true.

The temperature at which water boils is [ ].

The temperature at which water freezes is [ ].

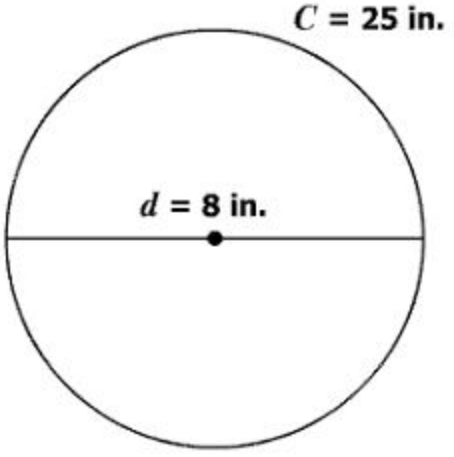
20°C	100°C	32°F	70°F	98°F

Which ordered pair best represents point Y on the grid?



- **A** $(6, -3)$
- **B** $(5, -2)$
- **C** $(-2, 5)$
- **D** $(-3, 6)$

Victor measured a circular lid and found d, the diameter, was 8 inches and C, the circumference, was 25 inches.



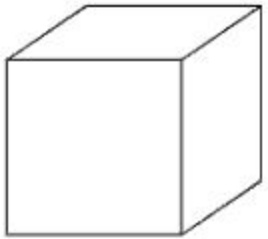
Which expression represents an approximate value for π ?

- **A** $25+8$
- **B** $25\div 8$
- **C** 25×8
- **D** $25-8$

Neela is making rectangular place mats that are 12 inches wide and 15 inches long. What is the least amount of ribbon that she will need to create a ribbon border around 1 place mat?

- **A** 54 inches
- **B** 54 square inches
- **C** 180 inches
- **D** 180 square inches

The edge length of a cube is shown.



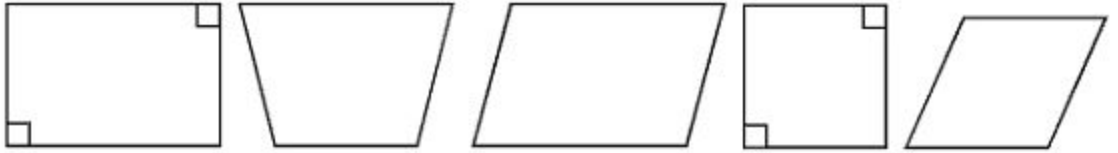
What is the total surface area of this cube?

- **A** 54 square meters
- **B** 36 square meters
- **C** 27 square meters
- **D** 18 square meters

Ava placed the point of her pencil on the origin of a regular coordinate plane. She marked a point after moving her pencil 4 units to the left and 7 units up. Which ordered pair identifies where Ava marked her point?

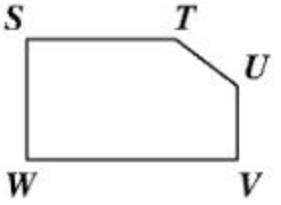
- **A** $(4, 7)$
- **B** $(-4, 7)$
- **C** $(7, 4)$
- **D** $(7, -4)$

Which term most accurately classifies all of the figures below?



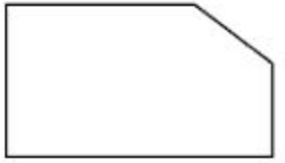
- **A** Square
- **B** Trapezoid
- **C** Quadrilateral
- **D** Parallelogram

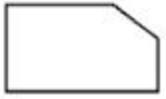
Figure $STUVW$ is shown.



Which polygon appears congruent to figure $STUVW$?

A

C 

B 

D

Directions: Click and drag each selected measurement to the correct box.

The area of a rectangle is 56 square inches. Identify the two measurements from those shown that could be the length and width of this rectangle.

Length ☐ by Width ☐

4 inches	6 inches	7 inches	8 inches	20 inches	50 inches

The diameter of a circular table is 6 feet. Which of the following is closest to the area of the tabletop?

- **A** 113.04 square feet
- **B** 28.26 square feet
- **C** 18.84 square feet
- **D** 9.42 square feet

Which of these best describes the location of (0, 9) on a coordinate grid?

- **A** In Quadrant I
- **B** In Quadrant II
- **C** On the x-axis
- **D** On the y-axis

The radius of a circular swimming pool is 7.8 meters. Which is closest to the circumference of this swimming pool?

- **A** 24.49 m
- **B** 47.76 m
- **C** 48.98 m
- **D** 191.04 m

Directions: Type your answer in the box.

What is the value of x when $\frac{x}{3} = 2.13$?

$x =$ ____

Directions: Click on a box to choose each color you want to select. You must select two correct colors.

Phil surveyed 40 students about their favorite color. This circle graph shows the results.

Identify two colors that together could represent the results of a group of exactly 20 students.

Yellow | Green | Blue | Pink | Red

Ivan created the arithmetic pattern shown.

1, 4, 7, 10

If Ivan continues the pattern, what will be the 7th number in the pattern?

- **A** 13
- **B** 16
- **C** 19
- **D** 22

This list shows the number of text messages 5 friends sent last week.

13, 60, 61, 63, 64

The most appropriate measure of center for this data is the —

- **A** mean because all the numbers are close to one another in value
- **B** median because all the numbers are close to one another in value
- **C** mean because 13 text messages is much lower than the other numbers
- **D** median because 13 text messages is much lower than the other numbers

What is the solution to this number sentence?

$$y - 1\frac{3}{4} = 3$$

- **A** $y = 1\frac{1}{4}$
- **B** $y = 1\frac{5}{7}$
- **C** $y = 4\frac{3}{4}$
- **D** $y = 5\frac{1}{4}$

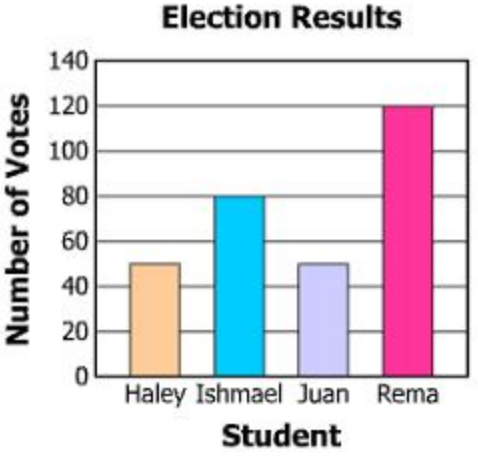
Hector has 15 shirts in his drawer that are all the same size and shape.

- **6 shirts are white**
- **4 shirts are blue**
- **3 shirts are red**
- **2 shirts are green**

Hector randomly selects two shirts without replacement. The outcome of the second shirt is —

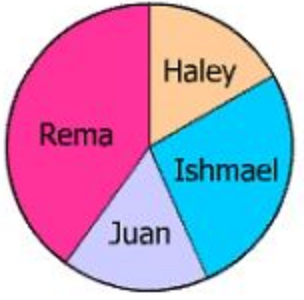
- **A** dependent on the outcome of the first shirt, because not replacing the first shirt affects the outcome of the second shirt
- **B** dependent on the outcome of the first shirt, because not replacing the first shirt does not affect the outcome of the second shirt
- **C** independent of the outcome of the first shirt, because not replacing the first shirt affects the outcome of the second shirt
- **D** independent of the outcome of the first shirt, because not replacing the first shirt does not affect the outcome of the second shirt

The sixth-grade class held elections for class president. This graph shows the results of the election.

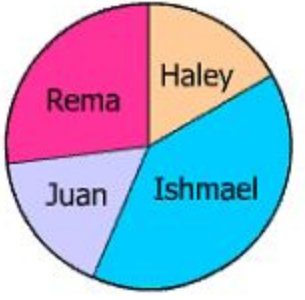


Which circle graph best represents the same set of data?

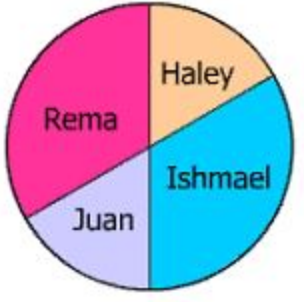
A



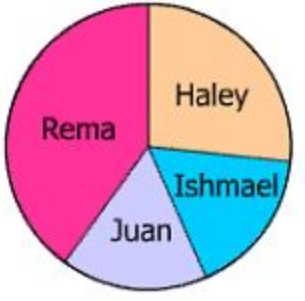
C



B



D



Which property is illustrated by this number sentence?

$$(0.7 + 1) \cdot 0 = 0$$

- **A** Additive identity property
- **B** Multiplicative property of zero
- **C** Multiplicative inverse property
- **D** Associative property of multiplication

Which of these best describes dependent events?

- **A** Randomly selecting a cube from a bag of 2 red cubes and 2 green cubes that are all the same size, not replacing it, then randomly selecting another cube
- **B** Randomly selecting a cube from a bag of 3 red cubes and 2 green cubes that are all the same size, replacing it, then randomly selecting another cube
- **C** Spinning the arrows of two spinners each with 2 equal sections one time
- **D** Spinning the arrow of a spinner with 3 equal sections two times

The first five terms of a sequence are shown.

4, 10, 16, 22, 28, . . .

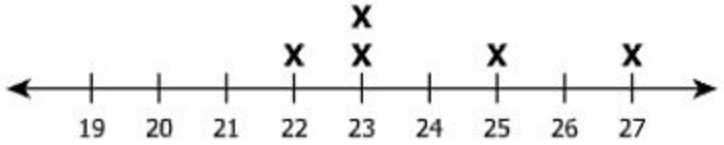
What is the common difference of this sequence?

- **A** 4
- **B** 6
- **C** 7
- **D** 10

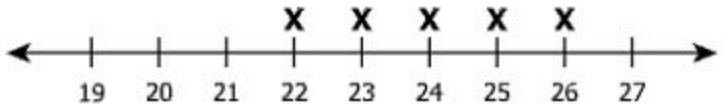
Which line plot shows a set of data with a balance point of 23 ?

A

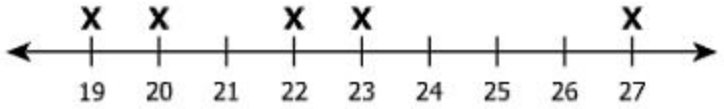
B



C



D



Directions: Click on a box to choose the property you want to select. You must select the correct property.

Which property is illustrated by this number sentence?

$$13 \cdot 1 = 13$$

Associative Property of Multiplication	Multiplicative Identity Property
Commutative Property of Multiplication	Multiplicative Inverse Property
Distributive Property	Multiplicative Property of Zero

Which number sentence illustrates the multiplicative inverse property?

- **A** $4 \cdot \frac{1}{4} = 1$
- **B** $\frac{1}{4} \cdot 0 = 0$
- **C** $1 \cdot \frac{1}{4} = \frac{1}{4}$
- **D** $\frac{1}{4} \cdot 0 = 0 \cdot \frac{1}{4}$

Cale used a certain rule to create this geometric pattern.

3, 12, 48, 192, 768

Which of these patterns follows the same rule as Cale's pattern?

- **A** 1, 4, 16, 64, 256
- **B** 4, 8, 12, 16, 20
- **C** 48, 44, 40, 36, 32
- **D** 88, 97, 106, 115, 124

Lee rolls a fair number cube labeled 1 through 6 two times. On both rolls, the number 6 lands face-up. In this situation, the second roll is —

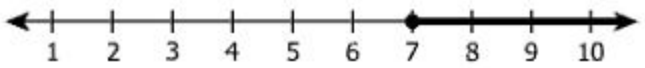
- **A** dependent on the first roll, because the outcome of the first roll affects the outcome of the second roll
- **B** dependent on the first roll, because the outcome of the first roll does not affect the outcome of the second roll
- **C** independent of the first roll, because the outcome of the first roll affects the outcome of the second roll
- **D** independent of the first roll, because the outcome of the first roll does not affect the outcome of the second roll

Which word describes 5 in the number sentence shown?

$$5x - 2 = 18$$

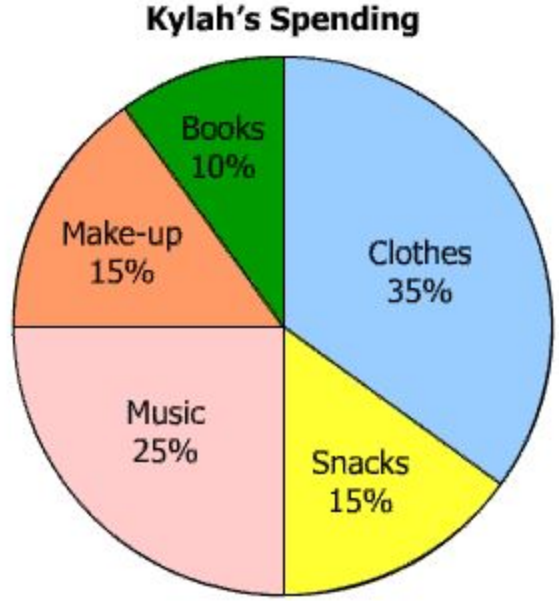
- **A** Term
- **B** Variable
- **C** Equation
- **D** Coefficient

Which number sentence can be used to represent all the values of n shown on this graph?



- **A** $n > 7$
- **B** $n \geq 7$
- **C** $n < 7$
- **D** $n \leq 7$

Kylah spent $15 each week for 10 weeks. This circle graph represents how Kylah spent her money on each of 5 types of items.



Based on this graph, which appears closest to the total amount Kylah spent on books and music for the 10-week period?

- **A** $35.00
- **B** $40.00
- **C** $50.00
- **D** $75.00

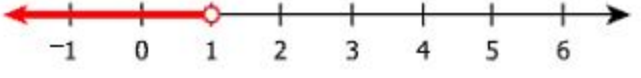
Which graph represents the solution set to this inequality?

$$1 \geq n$$

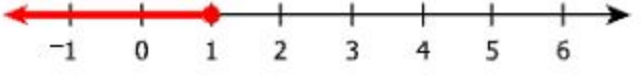
A

B

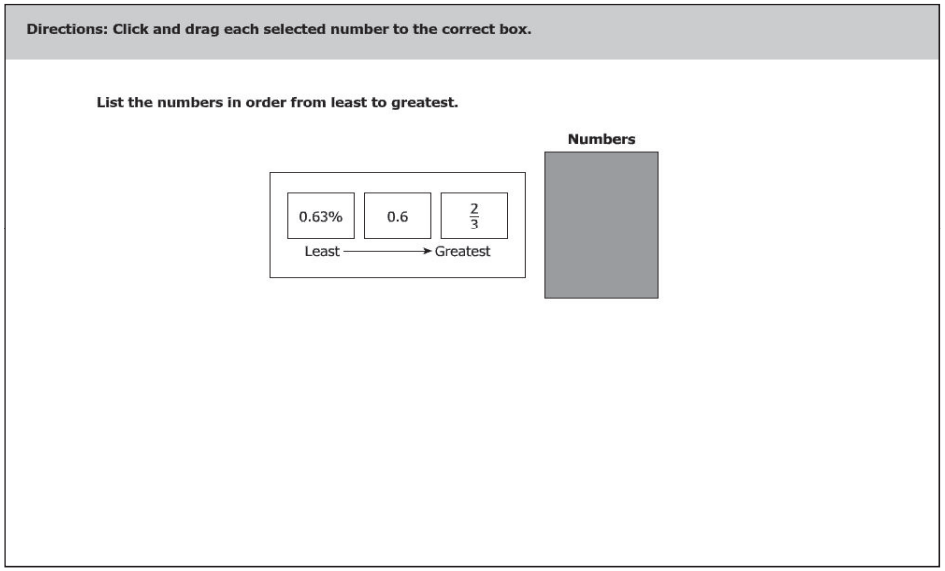
C

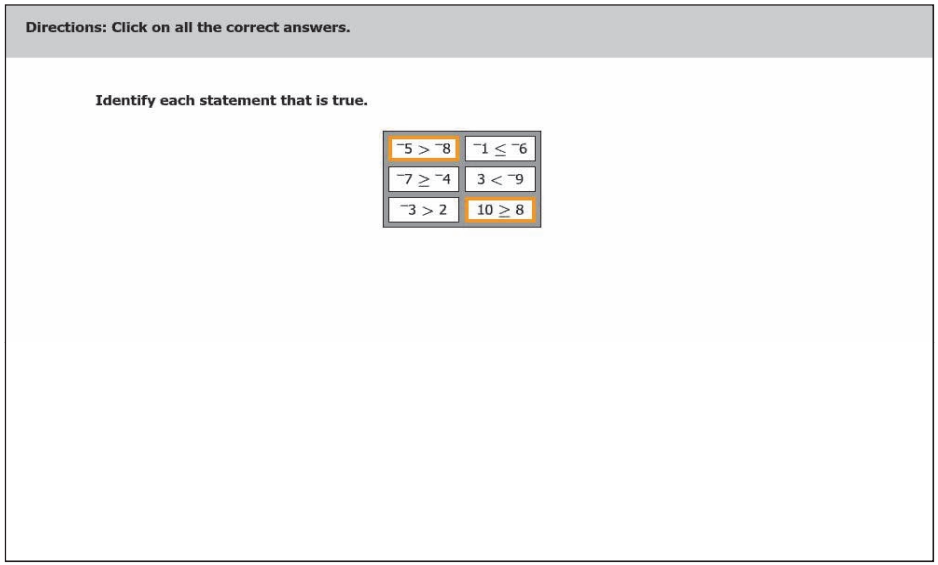


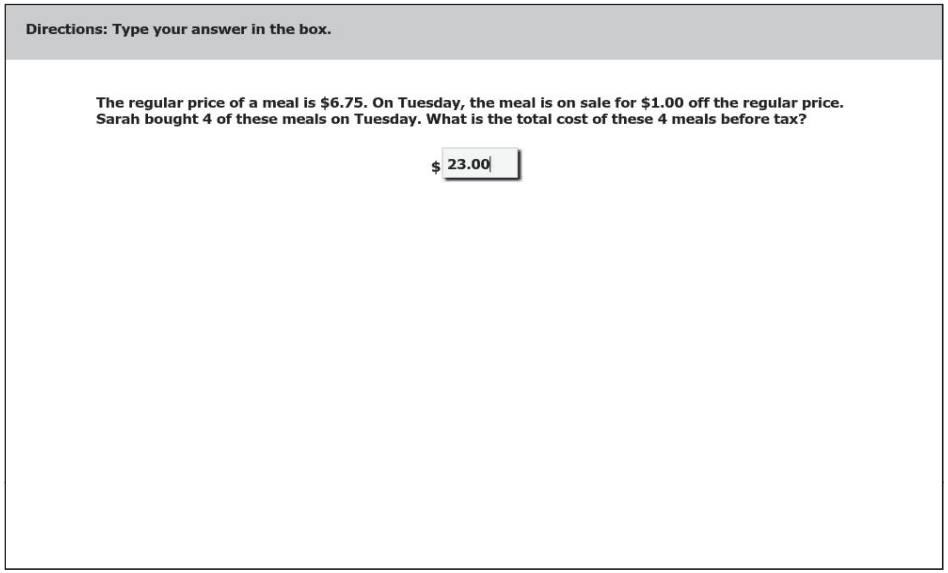
D

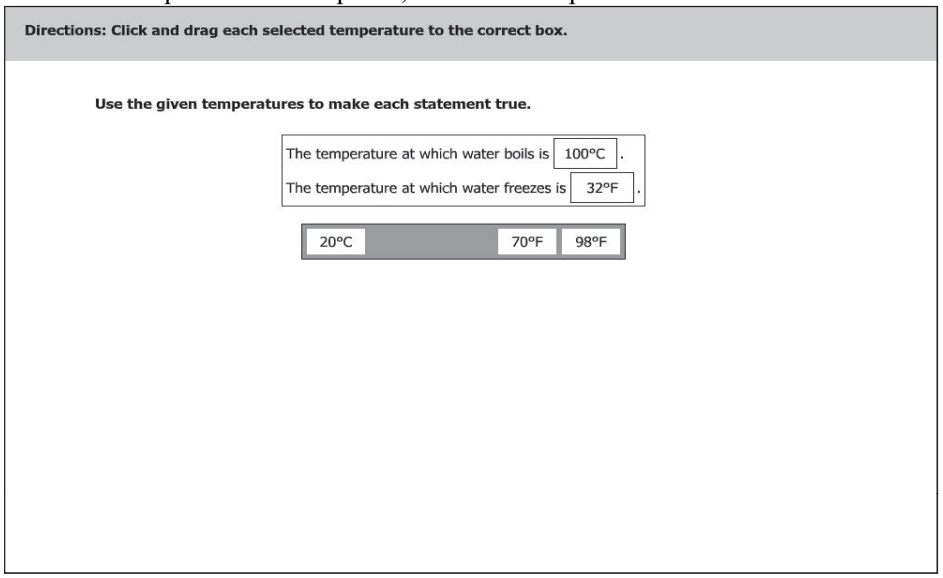


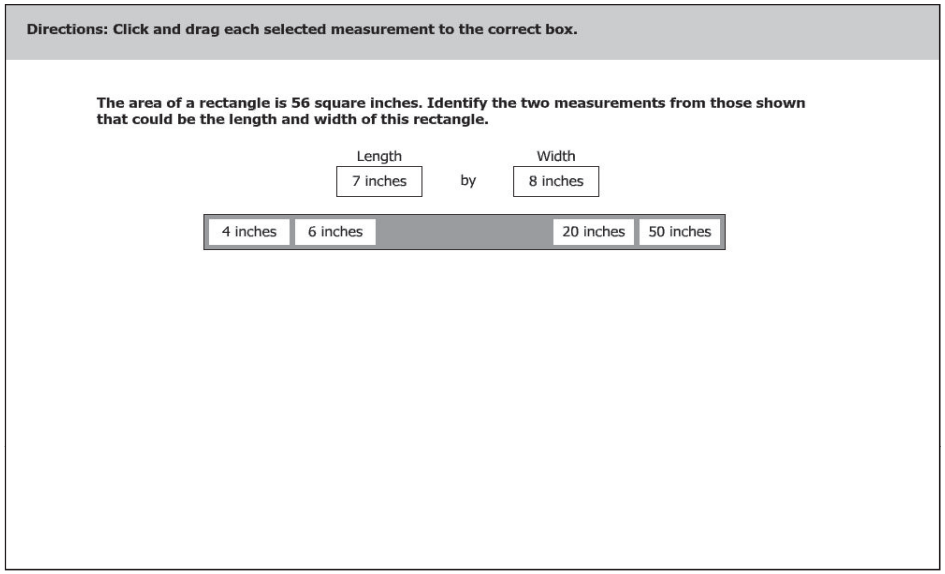
Grade 6 Mathematics
Released Test Spring 2014
Answer Key

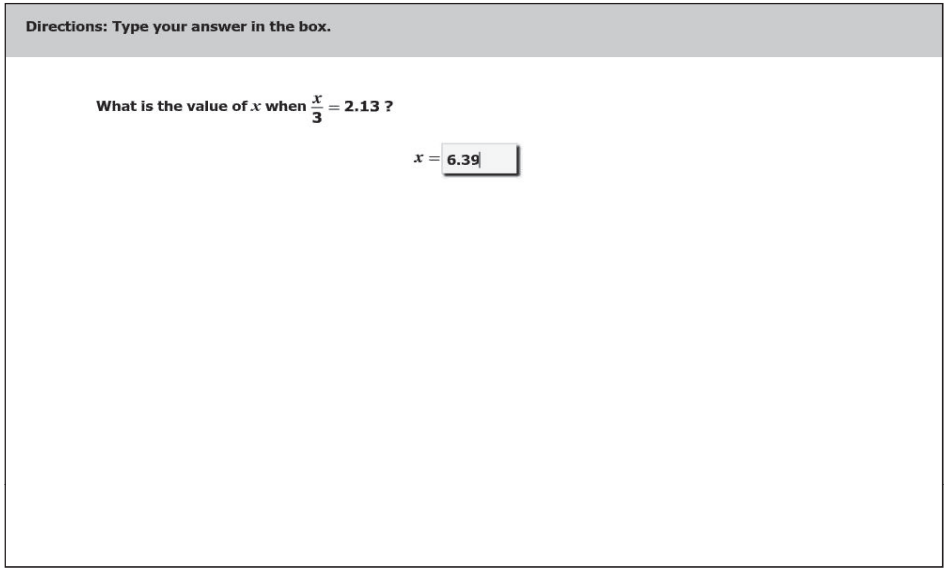
Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
1	MC	A	001	Number and Number Sense
2	MC	A	001	Number and Number Sense
3	TEI	Answers must be placed in the correct order from left to right: $0.63\%;\ 0.6;\ \frac{2}{3}$ 	001	Number and Number Sense
4	MC	A	002	Computation and Estimation
5	MC	B	002	Computation and Estimation
6	MC	C	002	Computation and Estimation
7	MC	C	002	Computation and Estimation
8	MC	B	001	Number and Number Sense
9	MC	C	001	Number and Number Sense

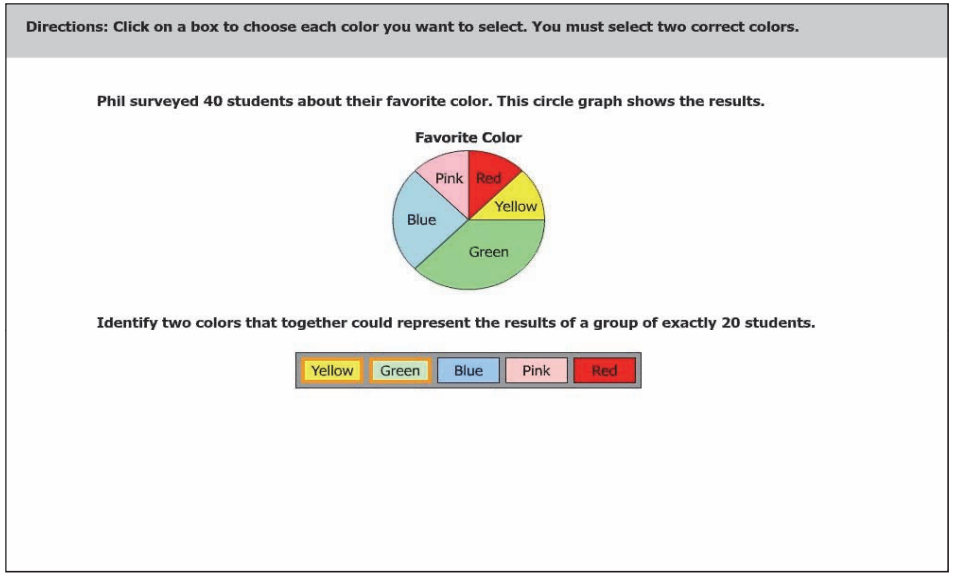
Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
10	MC	D	001	Number and Number Sense
11	MC	B	001	Number and Number Sense
12	TEI	–5 > –8 (the box located in the first row, first column) and 10 ≥ 8 (the box located in the third row, second column) Both of these answers, and only these answers, must be selected. 	001	Number and Number Sense
13	MC	C	001	Number and Number Sense
14	MC	D	001	Number and Number Sense
15	MC	A	002	Computation and Estimation
16	MC	D	002	Computation and Estimation
17	MC	B	002	Computation and Estimation
18	MC	D	002	Computation and Estimation

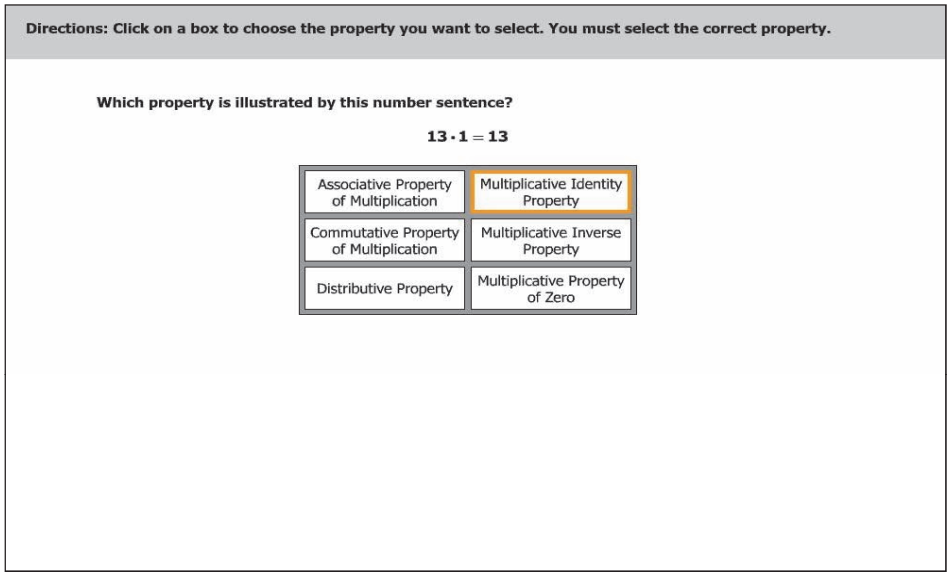
Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
19	TEI	Typed Response: 23.00 (and all equivalent answers) 	002	Computation and Estimation

Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
20	TEI	100°C must be placed in the top box; 32°F must be placed in the bottom box 	003	Measurement and Geometry
21	MC	B	003	Measurement and Geometry
22	MC	B	003	Measurement and Geometry
23	MC	A	003	Measurement and Geometry
24	MC	A	003	Measurement and Geometry
25	MC	B	003	Measurement and Geometry
26	MC	C	003	Measurement and Geometry
27	MC	D	003	Measurement and Geometry

Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
28	TEI	"7 inches" and "8 inches" must be placed in the boxes. The order in which they are placed in the boxes does not matter. 	003	Measurement and Geometry
29	MC	B	003	Measurement and Geometry
30	MC	D	003	Measurement and Geometry
31	MC	C	003	Measurement and Geometry

Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
32	TEI	Typed Response: 6.39 (and all equivalent answers) 	004	Probability, Statistics, Patterns, Functions, and Algebra

Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
33	TEI	ONE of these pairs of colors must be selected: Yellow (the first box from the left) and Green (the second box from the left); Green (the second box from the left) and Pink (the fourth box from the left); OR Green (the second box from the left) and Red (the last box on the right). The image below shows one of these pairs selected, Yellow and Green. 	004	Probability, Statistics, Patterns, Functions, and Algebra
34	MC	C	004	Probability, Statistics, Patterns, Functions, and Algebra
35	MC	D	004	Probability, Statistics, Patterns, Functions, and Algebra
36	MC	C	004	Probability, Statistics, Patterns, Functions, and Algebra
37	MC	A	004	Probability, Statistics, Patterns, Functions, and Algebra
38	MC	A	004	Probability, Statistics, Patterns, Functions, and Algebra
39	MC	B	004	Probability, Statistics, Patterns, Functions, and Algebra

Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
40	MC	A	004	Probability, Statistics, Patterns, Functions, and Algebra
41	MC	B	004	Probability, Statistics, Patterns, Functions, and Algebra
42	MC	A	004	Probability, Statistics, Patterns, Functions, and Algebra
43	TEI	Multiplicative Identity Property (the box located in the first row, second column) 	004	Probability, Statistics, Patterns, Functions, and Algebra
44	MC	A	004	Probability, Statistics, Patterns, Functions, and Algebra
45	MC	A	004	Probability, Statistics, Patterns, Functions, and Algebra
46	MC	D	004	Probability, Statistics, Patterns, Functions, and Algebra
47	MC	D	004	Probability, Statistics, Patterns, Functions, and Algebra
48	MC	B	004	Probability, Statistics, Patterns, Functions, and Algebra
49	MC	C	004	Probability, Statistics, Patterns, Functions, and Algebra
50	MC	D	004	Probability, Statistics, Patterns, Functions, and Algebra

Items 1 through 7 are in the non-calculator section of the test. Items 8 through 50 are in the calculator section of the test.

Spring 2014 Released
Grade 6 Mathematics Standards of Learning Test
Total Raw Score to Scaled Score Conversion Table

Total Raw Score If you get this many items correct:	**Total Scaled Score** Then your converted scaled score is:
0	0
1	218
2	249
3	268
4	282
5	293
6	303
7	311
8	319
9	326
10	332
11	338
12	344
13	349
14	354
15	359
16	364
17	368
18	372
19	377
20	381
21	385
22	389
23	393
24	397
25	**401**
26	405
27	409
28	413
29	416
30	420
31	424
32	429
33	433
34	437
35	441
36	446
37	451
38	456
39	461
40	466
41	472
42	478
43	485
44	493
45	**502**
46	513
47	526
48	544
49	574
50	600

A **total raw score** (left column) is converted to a **total scaled score** (right column). The total scaled score may range from 0 to 600.

A scaled score of 400 or more means the student passed the SOL test, while a scaled score of 399 or less means the student did not pass the test. A scaled score of 500 or more indicates the student passed the SOL test at an advanced level.

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