



# Smarter Balanced Assessment Consortium:

Mathematics Practice Test Scoring Guide  
Grade 8 Braille Version

08/01/2016



### About the Practice Test Scoring Guides

The Smarter Balanced Mathematics Practice Test Scoring Guides provide details about the items, student response types, correct responses, and related scoring considerations for the Smarter Balanced Practice Test items. The items selected for the Practice Test are designed to reflect

- a broad coverage of claims and targets that closely mirror the summative blueprint.
- a range of student response types.
- a breadth of difficulty levels across the items, ranging from easier to more difficult items.

It is important to note that all student response types are not fully represented on every practice test, but a distribution can be observed across all the practice tests. The items presented are reflective of refinements and adjustments to language based on pilot test results and expert recommendations from both content and accessibility perspectives.

Within this guide, each item is presented with the following information :

- Claim: statement derived from evidence about college and career readiness
- Domain: a broad content area that contains related targets and standards (i.e., Geometry)
- Target: statement that bridges the content standards and the assessment evidence that supports the claim
- Depth of Knowledge (DOK): measure of complexity considering the student's cognitive process in response to an item. There are four DOK levels, a 4 being the highest level.
- Common Core State Standards for Mathematical Content (CCSS-MC)
- Common Core State Standards for Mathematical Practice (CCSS-MP)
- Static presentation of the item: static presentation of item from test administration system
- Static presentation of student response field(s): static presentation of response field from test administration system
- Answer key or exemplar: expected student response or example response from score point value
- Rubric and applicable score points for each item: score point representations for student responses

The following items are representative of the kinds of items that students can expect to experience when taking the Computer Adaptive Test (CAT) portion of the summative assessment for grade 8. A separate document is available that provides a grade 8 sample performance task and scoring guide.

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<sup>1</sup> Most of these terms (Claim, Domain, Target, DOK, etc.) are defined in various other Smarter Balanced documents, as well as the Common Core State Standards for Mathematics. Refer to the *Content Specifications for the Summative Assessment of the Common Core State Standards for Mathematics* for more information.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#1	1	EE	B	1	8.EE.A.1	N/A

Enter the value of  $n$  for the equation  $5^n = 5^{11} \cdot 5^3$ .

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1	2	3
4	5	6
7	8	9
0	.	-

**Key:** 14

**Rubric:** (1 point) The student enters the correct number for  $n$ .

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#2	1	NS	A	1	8.NS.A.2	N/A

Select True or False to indicate whether each comparison is true.

	True	False
$\sqrt{37} < 5\frac{1}{4}$	<input type="checkbox"/>	<input type="checkbox"/>
$3\pi > 3\sqrt{3}$	<input type="checkbox"/>	<input type="checkbox"/>
$\sqrt{5} > \frac{5}{7}$	<input type="checkbox"/>	<input type="checkbox"/>
$\frac{15}{\sqrt{10}} > 8.38$	<input type="checkbox"/>	<input type="checkbox"/>

**Key:** F, T, T, F

**Rubric:** (1 point) The student correctly classifies each comparison as true or false.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#3	1	EE	B	1	8.EE.A.2	N/A

Select **all** possible values for  $x$  in the equation  
 $x^3 = 375$ .

- $5^3\sqrt{3}$
- $\sqrt[3]{375}$
- $75^3\sqrt{5}$
- $125^3\sqrt{3}$

**Exemplar:** (shown at right)

**Rubric:** (1 point) The student correctly identifies all possible values for  $x$ .

- $5^3\sqrt{3}$
- $\sqrt[3]{375}$
- $75^3\sqrt{5}$
- $125^3\sqrt{3}$

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#4	1	NS	A	1	8.NS.A.1	N/A

Determine for each number whether it is a rational or irrational number.

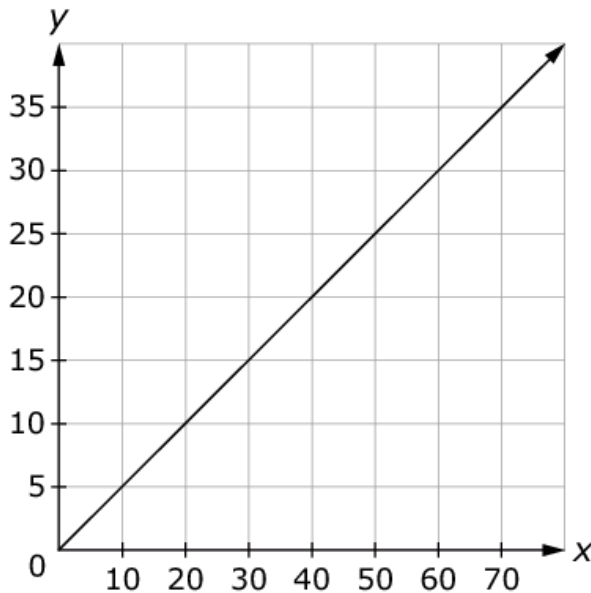
	<b>Rational</b>	<b>Irrational</b>
$\frac{1}{\sqrt{9}}$	<input type="checkbox"/>	<input type="checkbox"/>
$\sqrt{17}$	<input type="checkbox"/>	<input type="checkbox"/>
$-1\frac{2}{3}$	<input type="checkbox"/>	<input type="checkbox"/>
0.423	<input type="checkbox"/>	<input type="checkbox"/>

**Key:** R, I, R, R

**Rubric:** (1 point) The student correctly classifies each number as rational (R) or irrational (I).

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#5	1	EE	C	2	8.EE.B.6	4

Consider the line shown on the graph.



Enter the equation of the line in the form  $y = mx$  where  $m$  is the slope.

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1	2	3	x	y					
4	5	6	+	-	*	÷			
7	8	9	<	≤	=	≥	>		
0	.	-	$\frac{\square}{\square}$	$\square^\square$	( )		$\sqrt{\square}$	$\sqrt[\square]{\square}$	$\pi$

**Key:**  $y = \frac{1}{2}x$  or  $y = 0.5x$  or equivalent

**Rubric:** (1 point) The student enters a correct equation.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#6	3	EE	E	2	8.EE.A.1	3, 7

An expression is shown.

$$j^2 \left( \frac{k^6}{k^4 k^3} \right)^{-3}$$

Martha evaluates the expression using these steps:

Step 1:  $j^2 \left( \frac{k^6}{k^7} \right)^{-3}$

Step 2:  $j^2 (k^{-1})^{-3}$

Step 3:  $j^2 k^{-4}$

Martha made a mistake. In which step did Martha first make a mistake, and what is a correct expression for that step?

- (A) Step 2;  $j^2 (k^1)^{-3}$
- (B) Step 2;  $j^2 (k^{13})^{-3}$
- (C) Step 3;  $j^2 k^{-2}$
- (D) Step 3;  $j^2 k^3$

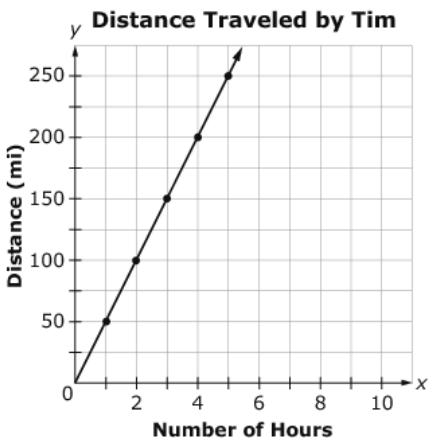
**Key:** D

**Rubric:** (1 point) The student selects the correct step and expression.



Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#7	1	EE	C	2	8.EE.B.5	7

This graph shows a proportional relationship between the distance traveled by Tim on a road trip and the number of hours for which he traveled.



Which statement identifies the correct slope and the correct interpretation of the slope for this situation?

- (A) The slope of the line is  $\frac{50}{1}$ , so the distance traveled by Tim is 50 miles every hour.
- (B) The slope of the line is  $\frac{50}{1}$ , so the distance traveled by Tim is 1 mile every 50 hours.
- (C) The slope of the line is  $\frac{1}{50}$ , so the distance traveled by Tim is 50 miles every hour.
- (D) The slope of the line is  $\frac{1}{50}$ , so the distance traveled by Tim is 1 mile every 50 hours.

**Key:** A

**Rubric:** (1 point) The student selects the statement that best describes the graph.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#8	1	F	F	2	8.F.B.4	8

A leaf falls 18 feet from a branch to the ground at a rate of 5 feet every 2 seconds.

Determine whether each statement about the leaf is true. Select True or False for each statement.

	True	False
The initial height of the leaf is 18 feet.	<input type="checkbox"/>	<input type="checkbox"/>
The leaf falls at a rate of $\frac{2}{5}$ foot every 1 second.	<input type="checkbox"/>	<input type="checkbox"/>
The leaf is 3 feet above the ground after 6 seconds.	<input type="checkbox"/>	<input type="checkbox"/>

**Key:** T, F, T

**Rubric:** (1 point) The student correctly classifies each statement as true or false.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#9	1	EE	D	2	8.EE.C.7	3

Sally is solving the linear equation  $13 + 4x - 9 = 7x + 7 - 3x$ . Her final two steps are:

$$4 + 4x = 4x + 7$$

$$4 = 7$$

Select the statement that correctly interprets Sally's solution.

- Ⓐ The solution is  $x = 0$ .
- Ⓑ The solution is the ordered pair  $(4, 7)$ .
- Ⓒ There is no solution since  $4 = 7$  is a false statement.
- Ⓓ There are infinitely many solutions since  $4 = 7$  is a false statement.

**Key:** C

**Rubric:** (1 point) The student selects the correct statement.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#10	1	F	E	1	8.F.A.1	8

Which table of values can be defined by the function  $y = 4x - 2$ ?

(A)

$x$	$y$
-4	-18
-2	-10
0	-2
2	6
4	14

(C)

$x$	$y$
-10	-2
-6	-1
-2	0
2	1
6	2

(B)

$x$	$y$
0	4
1	2
2	0
3	-2
4	-4

(D)

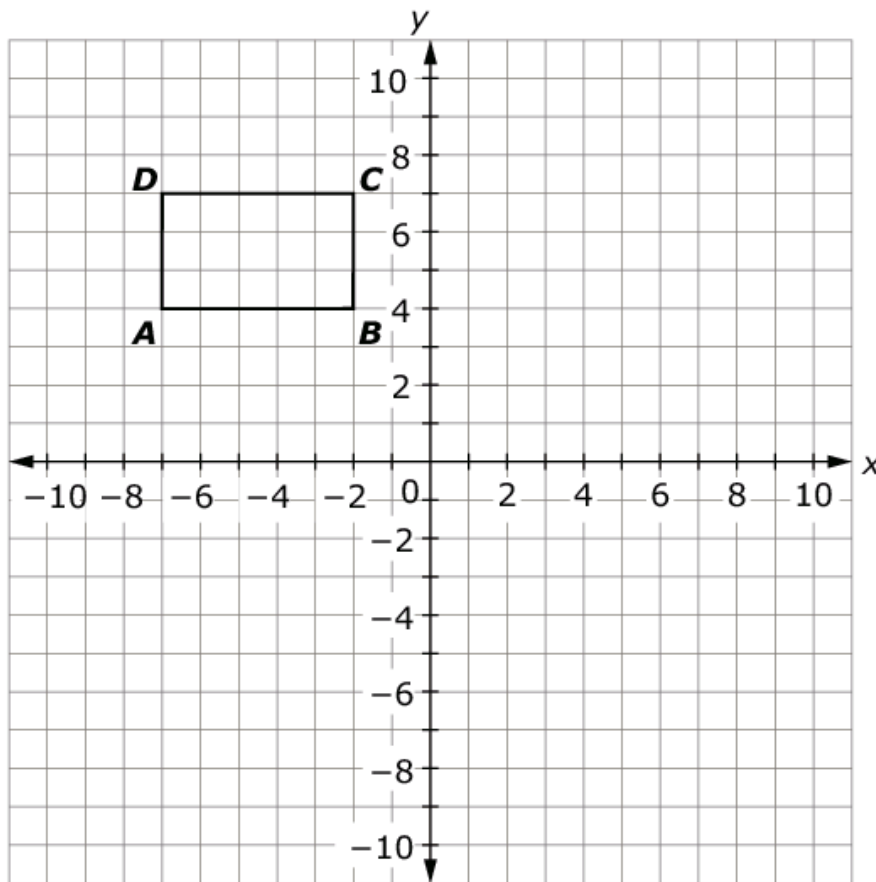
$x$	$y$
-2	4
0	2
2	0
4	-2
6	-4

**Key:** A

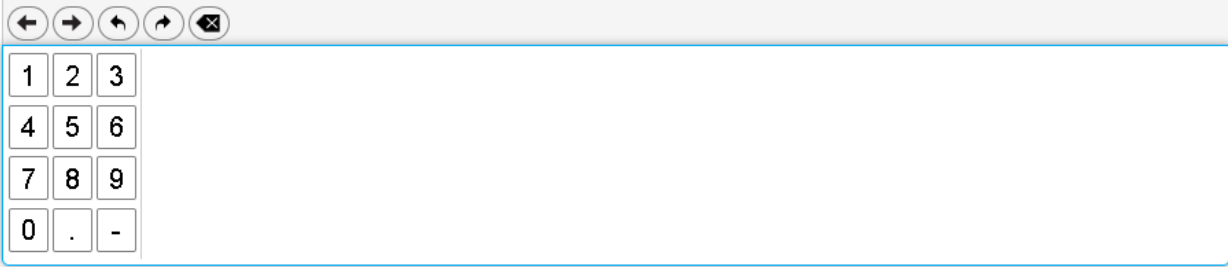
**Rubric:** (1 point) The student selects the correct table of values.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#11	1	G	G	1	8.G.A.1	N/A

Rectangle  $ABCD$  is rotated by 90 degrees clockwise about the origin and then translated 3 units left and 2 units down to form  $A'B'C'D'$ .



What is the length, in units, of line segment  $A'B'$  in the resulting figure?



**Key:** 5

**Rubric:** (1 point) The student enters the correct length.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#12	4	F	E	3	8.F.B	1

David and Karen have a goal to read 10,000 pages together by the end of summer.

- David reads 80 pages every day.
- Karen reads 25% more pages every day than David reads.

David and Karen agree that the model  $180d = 10,000$  will tell them how many days it will take them to read 10,000 pages, together, by the end of summer.

They invite Rick to read with them to get to their goal faster. Rick reads 35% fewer pages per day than Karen.

Which equation can be used to find how many days it will take David, Karen, and Rick to read 10,000 pages, together, by the end of summer?

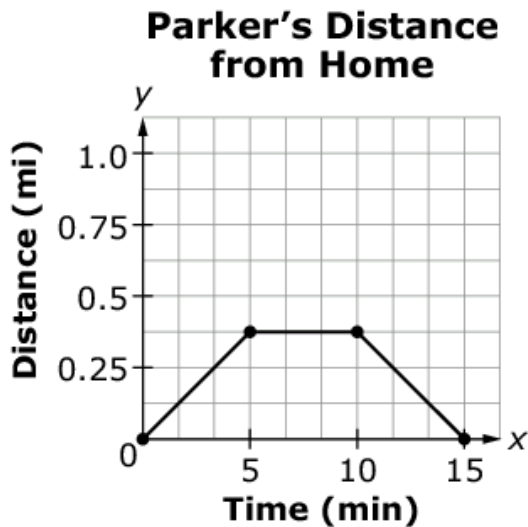
- Ⓐ  $232d = 10,000$
- Ⓑ  $245d = 10,000$
- Ⓒ  $288d = 10,000$
- Ⓓ  $315d = 10,000$

**Key:** B

**Rubric:** (1 point) The student selects the correct equation.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#13	1	F	F	2	8.F.B.5	1

The graph shows Parker's distance from home over time.



Based on the graph, determine whether each statement is true. Select True or False for each statement.

	True	False
Parker's distance from home is increasing between minute 1 and minute 4.	<input type="checkbox"/>	<input type="checkbox"/>
Parker's distance from home is constant between minute 6 and minute 7.	<input type="checkbox"/>	<input type="checkbox"/>
Parker's distance from home is increasing between minute 12 and minute 14.	<input type="checkbox"/>	<input type="checkbox"/>

**Key:** T, T, F

**Rubric:** (1 point) The student correctly classifies each statement as true or false.



Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#14	2	EE	A	2	8.EE.C.8	2

Mary is buying tickets for a movie.

- Each adult ticket costs \$9.
- Each child ticket costs \$5.
- Mary spends \$110 on tickets.
- Mary buys 14 total tickets.

Enter the total number of adult tickets and total number of child tickets she buys.

*Adult tickets*

*Child tickets*

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1	2	3
4	5	6
7	8	9
0	.	-

**Key:** 10 adult tickets, 4 child tickets

**Rubric:** (2 points) The student enters the correct number of adult tickets AND child tickets.

(1 point) The student enters the correct number of adult tickets OR child tickets.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#15	3	G	E	2	8.G.A.5	3

Marco says that the interior angles of a triangle add up to  $180^\circ$ . He claims that the interior angles of a hexagon must add up to  $360^\circ$  because a hexagon has twice as many vertices as a triangle and can be divided into two triangles. Therefore, its interior angles must sum to twice the value of those of a triangle.

Which statement, if any, explains Marco's error?

- (A) A hexagon does not have 6 vertices.
- (B) A hexagon can be divided into 4 triangles, not 2.
- (C) The interior angles of a triangle do not add up to  $180^\circ$ .
- (D) Marco's statement is correct and contains no error.

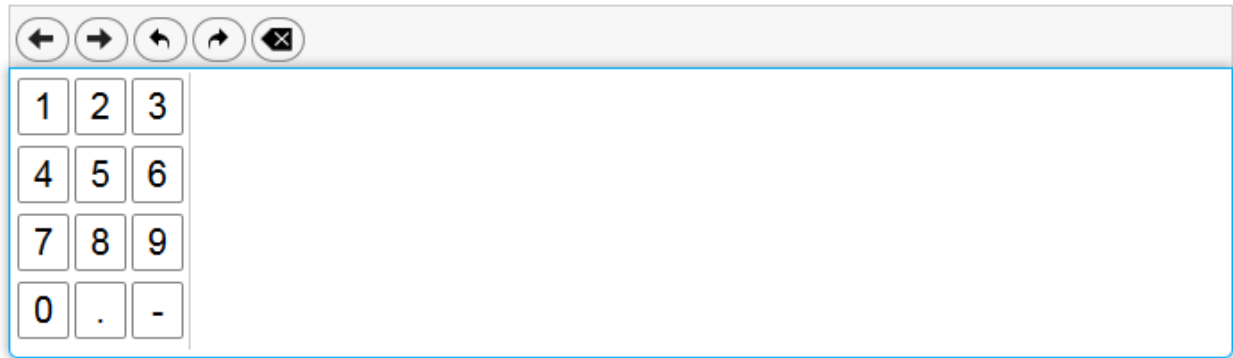
**Key:** B

**Rubric:** (1 point) The student selects the correct statement.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#16	2	EE	A	2	8.EE.C	2

Simone and Nang read a total of 23 books over the summer.  
Simone read 5 more books than Nang.

Enter the number of books Nang read.

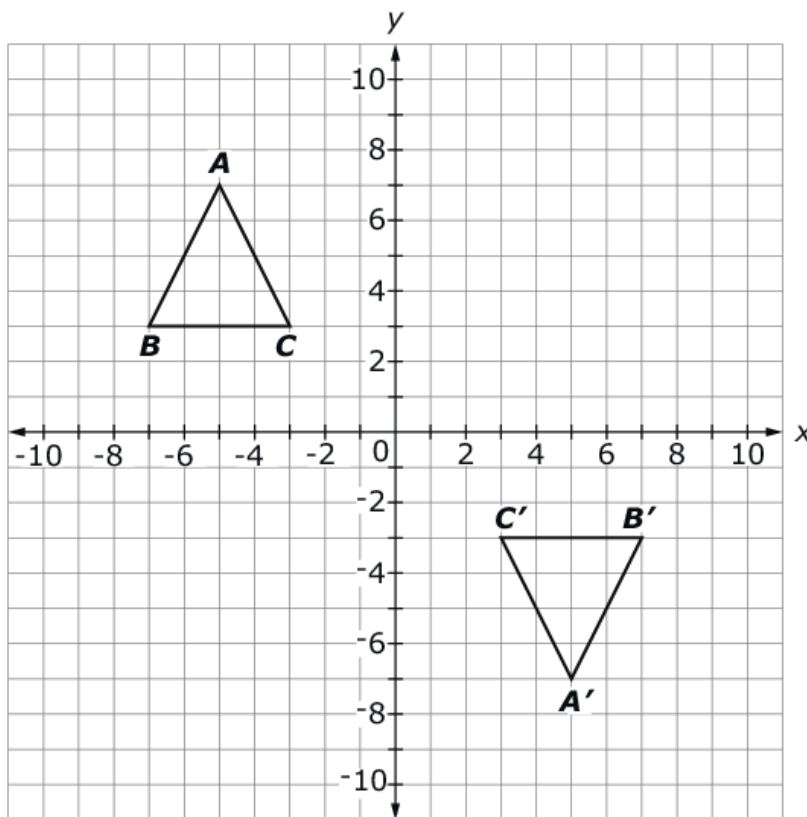
  


**Key:** 9

**Rubric:** (1 point) The student enters the correct number of books.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#17	1	G	G	2	8.G.A.3	2

Given triangle  $ABC$ .



Select **True** or **False** for each statement about the sequences of transformations that can verify that triangle  $ABC$  is congruent to triangle  $A'B'C'$ .

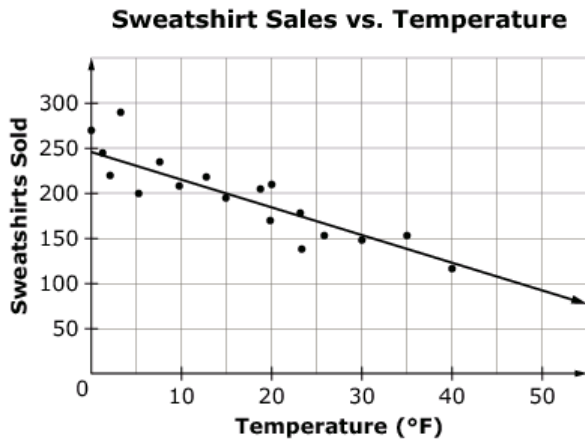
	<b>True</b>	<b>False</b>
Triangle $ABC$ is reflected across the $y$ -axis, followed by a reflection across the $x$ -axis.	<input type="checkbox"/>	<input type="checkbox"/>
Triangle $ABC$ is reflected across the $x$ -axis, followed by a reflection across the $y$ -axis.	<input type="checkbox"/>	<input type="checkbox"/>
Triangle $ABC$ is reflected across the $y$ -axis, followed by a translation 6 units down.	<input type="checkbox"/>	<input type="checkbox"/>

**Key:** T, T, F

**Rubric:** (1 point) The student correctly identifies each statement as true or false.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#18	1	SP	J	2	8.SP.A.3	4

This scatter plot shows the relationship between the number of sweatshirts sold and the temperature outside.



The  $y$ -intercept of the estimated line of best fit is at  $(0, b)$ . Enter the approximate value of the  $b$  in the first response box.

Enter the approximate slope of the estimated line of best fit in the second response box.

$y$ -intercept

slope

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1	2	3	+	-	*	÷				
4	5	6	<	≤	=	≥	>			
7	8	9	$\frac{\square}{\square}$	$\square^\square$	( )		$\sqrt{\square}$	$\sqrt[\square]{\square}$	$\pi$	
0	.	-								

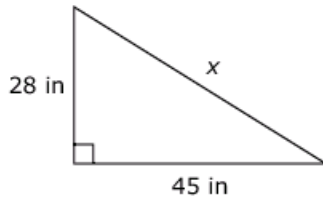
**Key:**  $y$ -intercept—any value from 240 to 250; slope—any value from -3 to -4

**Rubric:** (2 points) The student enters an acceptable  $y$ -intercept AND slope.

(1 point) The student enters an acceptable  $y$ -intercept OR slope.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#19	1	G	H	2	8.G.B.7	N/A

A cross section of a ramp is shown.



The length of the base is 45 inches and the height of the ramp is 28 inches.

Enter the length,  $x$ , of the ramp in inches.

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1	2	3
4	5	6
7	8	9
0	.	-

**Key:** 53

**Rubric:** (1 point) The student enters the correct length.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#20	3	EE	A,D	2	8.EE.C.7	3

Jamal states that  $ax + b = a(x + c)$ , given  $a$ ,  $b$ , and  $c$  are not equal to 0.

What must be the value of  $c$  for Jamal's statement to be true?

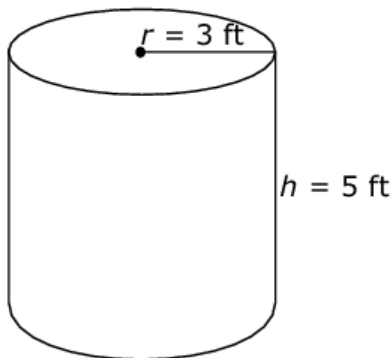
- (A)  $a$
- (B)  $b$
- (C)  $ac$
- (D)  $\frac{b}{a}$

**Key:** D

**Rubric:** (1 point) The student selects the correct value for  $c$ .

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#21	1	G	I	2	8.G.C.9	N/A

A cylinder with radius 3 feet and height 5 feet is shown.



Enter the volume of the cylinder, in cubic feet. Round your answer to the nearest hundredth.

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1	2	3
4	5	6
7	8	9
0	.	-

**Key:** any response between 141.30 and 141.53 to allow for various approximations of pi

**Rubric:** (1 point) The student enters a correct volume.



Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#22	3	F	G	3	8.F.A.3	6

Select **all** the equations that can be represented by a straight line when graphed on the coordinate plane.

- $\frac{1}{x} + y = 9$
- $x = 16 + 3y$
- $x = -2y^2 + 7$
- $8x - 5y = 30$
- $y = -6(x + 10)$
- $y = x(3 - x) + 1$

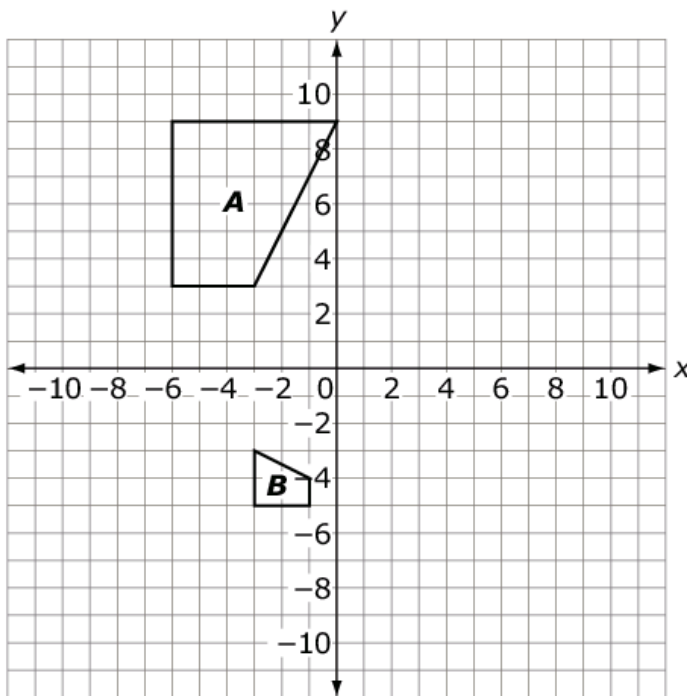
**Exemplar:** (shown at right)

**Rubric:** (1 point) The student selects all of the linear equations.

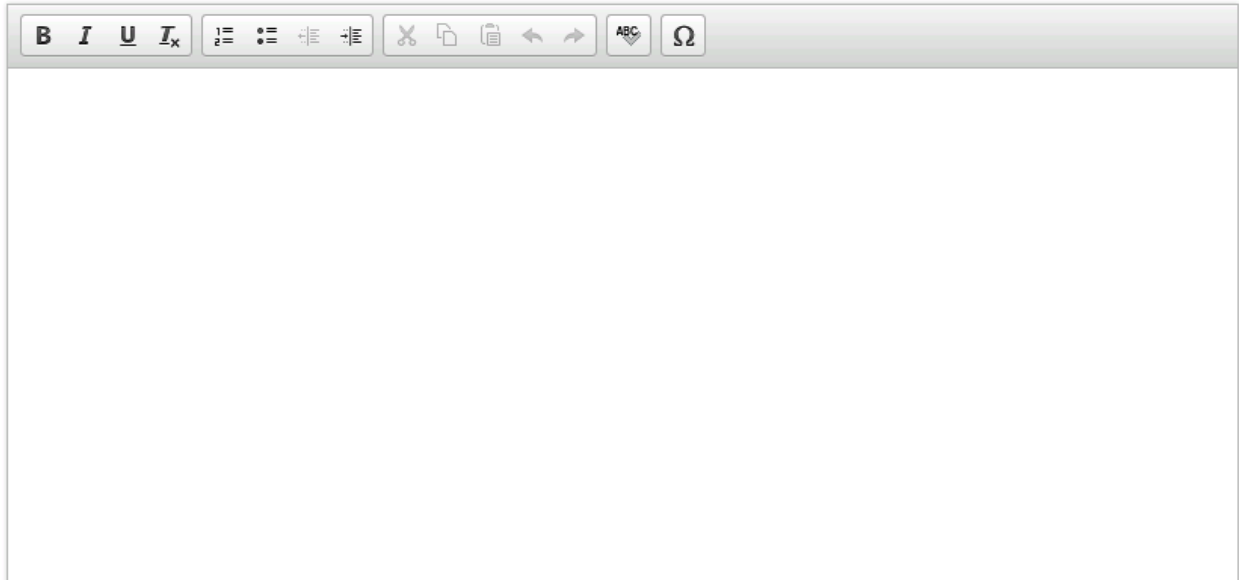
- $\frac{1}{x} + y = 9$
- $x = 16 + 3y$
- $x = -2y^2 + 7$
- $8x - 5y = 30$
- $y = -6(x + 10)$
- $y = x(3 - x) + 1$

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#23	3	G	B	4	8.G.A.4	2

Trapezoid *A* and trapezoid *B* are shown on the coordinate grid.



Describe three basic transformations on trapezoid *A* which show trapezoid *B* is similar to trapezoid *A*. In your response, be sure to identify the transformations in the order they would be performed.



**Sample Exemplar Response** (2 points): Trapezoid *A* was rotated 90 degrees counterclockwise about the origin. The resulting image was then dilated by a scale factor of  $\frac{1}{3}$ . The final transformation was a translation down by 3 units.

**Rubric:** (2 points) The student correctly lists three transformations performed on trapezoid *A* with sufficient detail to prove that trapezoid *B* is similar to trapezoid *A*. Included in the response is the correct scale factor for the dilation, and reference is made to the origin as the center of dilation.

(1 point) The student correctly lists a sequence of transformations, but detail is lacking or incomplete.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#24	4	SP	A	3	8.EE.C	4

A biologist tracks the number of bacteria living in a water tank. The biologist used a function that represents the amount of a certain chemical solution that is added to the water.

- When the water has no chemicals, the number of bacteria ( $b$ ) is 1200 per gallon.
- For each tablespoon of the chemical solution ( $c$ ) added to each gallon of water, the number of bacteria decreases by 75 per gallon.

How much of the chemical, in tablespoons, must be added to a 500-gallon tank to reduce the bacteria count to a safe 300 bacteria per gallon?

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1	2	3	$b$	$c$						
4	5	6	+	-	*	÷				
7	8	9	<	≤	=	≥	>			
0	.	-	$\frac{\square}{\square}$	$\square^\square$	( )		$\sqrt{\square}$	$\sqrt[\square]{\square}$	$\pi$	

**Key:** 6000

**Rubric:** (1 point) The student enters the correct number of tablespoons of chemical.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#25	4	SP	C	2	7.SP.C.8	6

Samantha gathered the following information on a given day at the dog park.

- There are 32 dogs playing at the dog park.
- 15 of the dogs are puppies.
- 11 of the dogs are not puppies and have long hair.
- There are 6 more dogs that have long hair than dogs that do not have long hair.

	Dogs That are Puppies	Dogs That are Not Puppies	Total
<b>Dogs with Long Hair</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Dogs That Do Not Have Long Hair</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Total</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Fill in the table completely to represent Samantha's data.

**Exemplar:** (shown at right)

**Rubric:** (2 points) The student correctly fills in all 9 cells.

(1 point) The student correctly fills in 6–8 cells.

	Dogs That are Puppies	Dogs That are Not Puppies	Total
<b>Dogs with Long Hair</b>	<input type="text" value="8"/>	<input type="text" value="11"/>	<input type="text" value="19"/>
<b>Dogs That Do Not Have Long Hair</b>	<input type="text" value="7"/>	<input type="text" value="6"/>	<input type="text" value="13"/>
<b>Total</b>	<input type="text" value="15"/>	<input type="text" value="17"/>	<input type="text" value="32"/>

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#26	1	EE	D	2	8.EE.C.8	N/A

Enter the  $y$  coordinate of the solution to this system of equations.

$$-2x + 3y = -6$$

$$5x - 6y = 15$$

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1	2	3
4	5	6
7	8	9
0	.	-

**Key:** 0

**Rubric:** (1 point) The student enters the correct  $y$  coordinate of the solution.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#27	3	RP	C	2	7.RP.A.2	1

The ratios  $a:b$  and  $b:c$  are equivalent to one another.

Select **all** the statements that must be true.

- $a = c$
- $\frac{b}{a} = \frac{c}{b}$
- $b - a = c - b$
- $a < b$  and  $b < c$
- if  $a = b$ , then  $b = c$

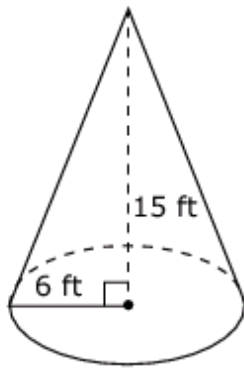
**Exemplar:** (shown at right)

**Rubric:** (1 point) The student correctly identifies all the true statements.

- $a = c$
- $\frac{b}{a} = \frac{c}{b}$
- $b - a = c - b$
- $a < b$  and  $b < c$
- if  $a = b$ , then  $b = c$

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#28	1	G	I	2	8.G.C.9	N/A

A cone with radius 6 feet and height 15 feet is shown.



Enter the volume, in cubic feet, of the cone. Round your answer to the nearest hundredth.

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1	2	3
4	5	6
7	8	9
0	.	-

**Key:** 565.49

**Rubric:** (1 point) The student gives a correct value within a range to accommodate different acceptable values of pi (565.1 to 565.5).



Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#29	2	EE, RP	D	3	8.EE.C.8, 6.RP.A.3	1

There are a total of 500 students in grades 1 through 5 in an elementary school.

- 17% of the total number of students are in 1st grade.
- 19% of the total number of students are in 4th grade.
- The number of 3rd-grade students is 9 less than the number of 4th-grade students.
- The number of 2nd-grade students is 10 less than the number of 5th-grade students.

Complete the table to show the number of students in each grade. Enter your answers in the table.

### Elementary School Students

Grade	Number of Students
1st	<input type="text"/>
2nd	<input type="text"/>
3rd	<input type="text"/>
4th	<input type="text"/>
5th	<input type="text"/>

**Exemplar:** (shown at right)

**Rubric:** (2 points) The student enters the correct number of students for all five cells.

(1 point) The student enters the correct number of students for three or four of the cells.

### Elementary School Students

Grade	Number of Students
1st	<input type="text" value="85"/>
2nd	<input type="text" value="112"/>
3rd	<input type="text" value="86"/>
4th	<input type="text" value="95"/>
5th	<input type="text" value="122"/>