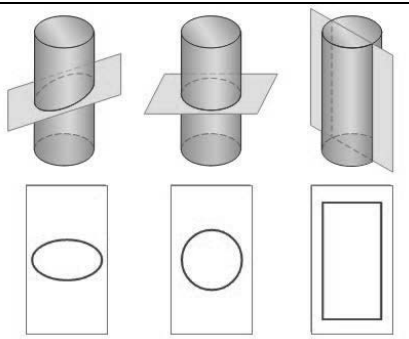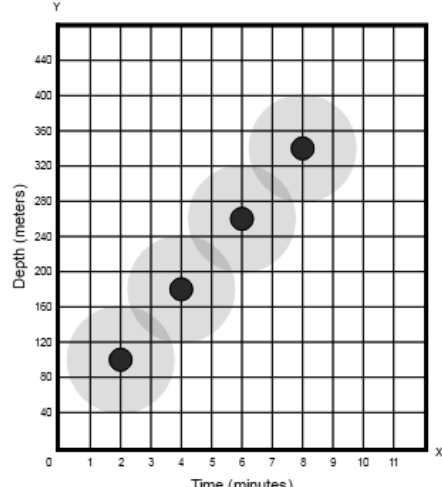# Released Test Answer and Alignment Document

Mathematics – Grade 7

Spring 2016

Item Number	Answer Key	Evidence Statement Key
1.	D, E, F	7.NS.1c-1
2.	D	7.NS.3
3.	B	7.RP.2d
4.	D, E	7.EE.1
5.	$-\left(\dfrac{50}{8}\right)$ or $-\left(\dfrac{-50}{-8}\right)$	7.NS.2b-1
6.		7.EE.2
7.	C	7.RP.2b
8.	C	7.NS.3
9.	A	7.NS.1b-1
10.	C	7.EE.4a-1
11.	4	7.RP.2b
12.	B	7.NS.2b-2
13.	$n = -5$ $x = 0$	7.EE.4a-2
14.	C	7.RP.2c

15.	D, E	7.NS.1d
16.	C	7.EE.1
17.	A, D, F	7.SP.1
18.	Part A: 29.85 Part B: 9.5	7.RP.3-2
19.	See Rubric	7.D.1
20.		7.G.3
21.	$\frac{1}{216}$ or equivalent	7.SP.8a
22.	C	7.SP.6
23.	Part A: 1.20 Part B: 2.10	7.EE.3
24.	Part A: B Part B: 9 Part C: A Part D: B	7.RP.3-1
25.	Part A: Part B: See Rubric	7.C.4

26.	3.20, 3.21, 3.22, 3.23, 3.24, or 3.25 accepted	7.RP.1
27.	See Rubric	7.D.4
28.	Part A: See Rubric Part B: See Rubric	7.C.8
29.	Part A: 43.96, 43.98, 43.99, or 44 accepted Part B: A	7.G.4-1
30.	$$\frac{1}{2}$$ or equivalent	7.RP.1
31.	Part A: 294 Part B: C	7.SP.2
32.	See Rubric	7.C.7-3
33.	Select from the drop-down menus to correctly complete each sentence. During that week, [Liz ▼] typically rode further each day because the [mean ▼] of her data is greater. During that week, [Liz ▼] typically rode about the same number of miles each day because the [range ▼] of her data is smaller.	7.SP.4
34.	Part A: 15 Part B: 192	7.G.1
35.	Part A: 1.50 Part B: See Rubric Part C: See Rubric	7.D.2
36.	A, D	7.RP.2a
37.	Part A: See Rubric Part B: See Rubric	7.C.1-1
38.	Part A: C Part B: 33.25	7.EE.3

#19 Rubric

Score	Description
3	Student response includes each of the following 3 elements. • **Modeling component** = 1 point 　○ The student writes a correct equation. • **Computation component** = 1 point 　○ The student provides the correct price of one museum ticket, $8. • **Modeling component** = 1 point 　○ The student provides a valid explanation or work. Sample Student Response: $4(x + 1.50) = 38$ or equivalent $4x + 6 = 38$ $4x = 32$ $x = 8$ The cost of one ticket is $8.
2	Student response includes 2 of the above elements.
1	Student response includes 1 of the above elements.
0	Student response is incorrect or irrelevant.

#25 Rubric Part A (Machine Scored)

Score	Description
1	Student response includes the following element. • **Reasoning component** = 1 point 　○ Student correctly plots the points (2, 100), (4, 180), (6, 260), and (8, 340) on the coordinate grid.
0	Student response is incorrect or irrelevant.

#25 Rubric Part B

Score	Description
2	Student response includes both of the following 2 elements. • **Reasoning component** = 1 point 　○ Student provides a valid explanation, using the table, of why the

relationship is not proportional.
- **Reasoning component** = 1 point
  - o Student provides a valid explanation, using the graph, of why the relationship is not proportional.

Sample Student Response:

The relationship is not proportional. The table supports that the relationship is not proportional because the ratio between the two quantities is not the same for each *x*- and *y*-value.

$$\frac{100}{2} \neq \frac{180}{4} \neq \frac{260}{6} \neq \frac{340}{8}$$

Because the ratios are not equal, the student can conclude that the relationship is not proportional.

The graph supports that the relationship is not proportional because the points I plotted on the graph of the relationship lie on a line, but the line does not intersect the origin. Instead, it intersects the *y*-axis at the point (0, 20). Therefore, the relationship between depth and time is not proportional.

(If students correctly apply this method, count their work as correct.)

1	Student response includes 1 of the above elements.
0	Student response is incorrect or irrelevant.

#27 Rubric	
Score	**Description**
3	Student response includes each of the following 3 elements. • **Computation component** = 1 point o The student provides a number or a range of numbers that fall(s) between 120 and 136. • **Modeling component** = 1 point o The student provides an estimation procedure to approximate the number of servings that can be dispensed before the juice dispenser needs to be refilled. • **Modeling component** = 1 point o The student correctly applies the estimation procedure to determine a reasonable number of servings in a filled juice

dispenser.

Sample Student Response:

"Approximately 7 out of 10 students choose a 4-ounce serving. Therefore, approximately 3 out of 10 students choose the 8-ounce serving. So, for every 10 students, the total amount of juice dispensed is approximately 7 x 4 + 3 x 8 = 52 fluid ounces. This means that juice is dispensed at a rate of 5.2 fluid ounces per serving."

"Since a typical juice serving is 5.2 fluid ounces, I need to divide 640 by 5.2 to get the number of servings of juice in the full dispenser. And 640÷5.2 is about 123 servings."

Notes:

- The student may receive up to a total of 1 modeling point if he or she computes the correct answer but shows insufficient work to indicate a correct modeling process.

- The student may receive only the computation point if he or she provides a reasonable estimate but does not include any work or modeling to explain how the estimate was determined.

- The student may receive credit for providing equivalent expressions in the modeling process.

2	Student response includes 2 of the above elements.
1	Student response includes 1 of the above elements.
0	Student response is incorrect or irrelevant.

#28 Rubric Part A	
Score	**Description**

2	Student response includes the following 2 elements.
	
	• **Reasoning component** = 1 point
	   o The student provides an explanation and work showing that expression 1 is equivalent to the expression the teacher wrote.
	• **Reasoning component** = 1 point
	   o The student provides an explanation and work showing that expression 2 is equivalent to the expression the teacher wrote.

	Sample Student Response:
	Both expressions could be equivalent to the expression written on the board, since it is possible to have more than one equivalent expression.
	If I start with the teacher's expression and distribute, combine like terms, and then factor I can rewrite it so that it is the same as expression 1. This means that the student's claim that expression 1 is equivalent to the teacher's expression is correct.
	$12.2x + 50.6y + 3(1.4x - 2.6y)$ $= 12.2x + 50.6y + 4.2x - 7.8y$ $= 16.4x + 42.8y$ $= 4(4.1x) + 4(10.7y)$ $= 4(4.1x + 10.7y)$
	If I start with the teacher's expression and distribute, combine like terms, and then factor I can rewrite it so that it is the same as expression 2. This means that the student's claim that expression 2 is equivalent to the teacher's expression is correct.
	$12.2x + 50.6y + 3(1.4x - 2.6y)$ $= 12.2x + 50.6y + 4.2x - 7.8y$ $= 2(6.1x) + 2(25.3y) + 2(2.1x) - 2(3.9y)$ $= 2(6.1x + 25.3y + 2.1x - 3.9y)$
1	Student response includes 1 of the above elements.
0	Student response is incorrect or irrelevant.

#28 Rubric Part B

Score	Description

2	Student response includes the following 2 elements.
	
	 • **Reasoning component** = 1 point
	     o The student provides an explanation for which part of the student's reasoning is correct and for which part of the student's reasoning is incorrect.
	 • **Reasoning component** = 1 point
	     o The student provides an example using different values for x and y to support his/her explanation.

Sample student response:

The part of the student's reasoning that is correct is that the value of each expression is the same when $x = 1$ and $y = 1$ is the same.

$12.2x + 50.6y + 3(1.4x - 2.6y)$

$12.2(1) + 50.6(1) + 3(1.4(1) - 2.6(1))$

$= 12.2 + 50.6 + 4.2 - 7.8$

$= 59.2$

And

$59.2xy = 59.2(1)(1) = 59.2$

The part of the student's reasoning that is incorrect is that the student only checks for one substitution of the x and y values for each expression. In order for the expressions to be equivalent, they must have the same value for all values of x and y. This student has only shown the expressions are equivalent for one pair of values. Using $x = 1$ and $y = 2$ will show the expressions do not always have the same value, so Greg's conjecture is not correct.

$12.2x + 50.6y + 3(1.4x - 2.6y)$

$12.2(1) + 50.6(2) + 3(1.4(1) - 2.6(2))$

$= 12.2 + 101.2 + 3(1.4 - 5.2)$

$= 12.2 + 101.2 + 4.2 - 15.6$

$= 102$

And

$59.2xy = 59.2(1)(2) = 118.4$

So we see that the two expressions are not equivalent for all values of x and y.

1	Student response includes 1 of the above elements.
0	Student response is incorrect or irrelevant.

#32 Rubric	
Score	**Description**

3	Student response includes each of the following 3 elements.
	
	• **Reasoning component** = 1 point
	    o The student provides a correct description of the error made by Student P in step 1.
	• **Reasoning component** = 1 point
	    o The student provides a correct description of the error made by Student Q in step 3.
	• **Reasoning component** = 1 point
	    o The student provides a correct set of steps shown to determine the value of the expression, -40.92.
	
	Sample Student Response:
	
	Student P made one error, which occurred in step 1.
	
	From the original expression to step 1, each term in the first set of parentheses is multiplied by -2.5. The error in step 1 is that -2.5 x 3.1 = -7.75 not 7.75. There are no additional errors in Student P's steps.
	
	Student Q made one error, which occurred in step 3.
	
	Since all terms in step 2 are negative or are being subtracted, -1 can be factored from each term. This would leave only positive terms inside the parentheses.
	
	That is, the student should have indicated that
	$-3.5 - 7.75 - 29.67 = -(3.5 + 7.75 + 29.67)$.
	
	There are no additional errors in Student Q's steps.
	
	A correct set of steps to determine the value of the expression is shown.
	
	$-2.5(1.4 + 3.1) + 6.9(-4.3)$
	$-3.5 + {-}7.75 + {-}29.67$
	$-3.5 - 7.75 - 29.67 = -40.92$
	
	or

	−2.5(1.4 + 3.1) + 6.9(−4.3) −2.5(4.5) + −29.67 −11.25 + −29.67 = −40.92 or other valid response
2	Student response includes 2 of the above elements.
1	Student response includes 1 of the above elements.
0	Student response is incorrect or irrelevant.

#35 Rubric Part A (Machine Scored)	
Score	**Description**

1	Student response includes the following element.
	
	    • **Computation component** = 1 point
	        o The student provides a response of 1.50 or equivalent
	.

0	Student response is incorrect or irrelevant.
#35 Rubric Part B	
Score	**Description**

2	Student response includes the following 2 elements.
	
	    • **Computation component** = 1 point
	        o The student provides a response of 38 pages.
	    • **Modeling component** = 1 point
	        o The student provides a correct modeling process to determine the number of pages in a small photo book costing $57.
	
	Sample Student Response:
	
	"The cost per page is $1.50. So a book costing $57 would have 57 ÷ 1.50 = 38 pages."
	
	Notes:
	
	    • The student may receive a computation point for calculating the number of pages for a small photo book when the answer is based on the incorrect price per page from Part A.
	    • The student may receive a modeling point for applying a correct strategy to find the number of pages for a small photo book based on

	an incorrect price per page.
1	Student response includes 1 of the above elements.
0	Student response is incorrect or irrelevant.

#35 Rubric Part C

Score	Description

3	Student response includes the following 3 elements.
	
	• **Computation component** = 1 point
	    o The student determines a correct cost of $68.25.
	• **Modeling component** = 1 point
	    o The student provides a correct modeling process to determine the cost per page for a large photo book.
	• **Modeling component** = 1 point
	    o The student provides a correct modeling process to determine the cost for a large photo book with 35 pages.
	
	Sample Student Response:
	
	"The cost per page for a large photo book is 30% more than the cost per page of a small photo book. So, the cost per page is $1.50 x 1.3 = $1.95."
	
	"The cost for a large photo book with 35 pages is 35 x $1.95 = $68.25."
	
	Notes:
	
	• The student may receive a computation point for calculating the cost of a large photo book when the answer is based on the incorrect price per page for a small photo book from Part A.
	• The student may receive a modeling point for applying a correct strategy to find the price per page for a large photo book based on an incorrect price per page for the small photo book.
	• The student may receive a modeling point for applying a correct strategy to find the total cost for a large photo book based on an incorrect price per page.
	
	Further Notes:
	
	• The student may solve these using alternate methods and receive computation and modeling points for correct computations and modeling processes.
	• The student may receive a combined total of 3 points if the

modeling processes are correct but the student makes one or more computational errors in Parts B and C resulting in incorrect answers or an incorrect conclusion.
- The student may receive up to a total of 3 points if he or she computes the correct answers but shows no work or insufficient work to indicate correct modeling processes.
- The student cannot receive more than 2 points for modeling if the explanations, while sufficient to indicate that the student had correct reasoning, contain nonsense statements.

2	Student response includes 2 of the above elements.
1	Student response includes 1 of the above elements.
0	Student response is incorrect or irrelevant.

#37 Rubric Part A	
Score	**Description**

2	Student response includes each of the following 2 elements.
	
	• **Computation component** = 1 point
	    o The student finds the difference between high and low tides for Location P, 7.9 feet. The student finds the high tide for Location R, 5.73 feet.
	• **Reasoning component** = 1 point
	    o The student shows work or explanation how both answers were determined.
	
	NOTE: A student could earn the points this alternative way:
	
	• 1 point: Finds the difference between high and low tides for Location P, 7.9 feet and shows work or explanation.
	• 1 point: Finds high tide for Location R, 5.73 feet and shows work or explanation.
	
	Sample Student Response:
	
	For Location P, I subtract the low tide from the high tide (8.53 − 0.63). For Location R, I add the difference between the tides and the low tide (6.75 + (−1.02)). (Accept other valid explanations.)
	
	The difference at Location P is 7.9 ft.

	High tide at Location R is 5.73 ft.
1	Student response includes 1 of the above elements.
0	Student response is incorrect or irrelevant.

#37 Rubric Part B	
Score	**Description**

2	Student response includes each of the following 2 elements.
	
	• **Computation component** = 1 point
	    o The student finds the value of the low tide at location T, 0.25 ft.
	• **Reasoning component** = 1 point
	    o The student shows work or explains how the answer was found.
	
	Sample Student Response:
	
	The low tide at location T is 0.25 ft. (Accept equivalent answers.)
	
	For a mean of −0.27 the sum of the 4 low tides has to be 4(−0.27) = −1.08.
	Subtract the sum of the known low tides.
	−1.08 − (0.63 + (−0.94) + (−1.02))
	= −1.08 − (−1.33)
	= −1.08 + 1.33 = 0.25
	
	(Accept other valid explanations.)

1	Student response includes 1 of the above elements.
0	Student response is incorrect or irrelevant.