

Math Spring 2021

Grade 8

Alignment Document and Answer Key

Table 1: Grade 8 2021 Released Items

Sequence	UIN	Evidence Statement	Sub-Claim	Task Type	Points	Calculator	Functionality	2021 Online 1 Form
1	M800227	8.NS.1	B	1.1	1	N	MC	<input checked="" type="checkbox"/>
2	M800399	8.NS.2	B	1.1	1	N	MC	<input checked="" type="checkbox"/>
3	M800267	8.SP.2	B	1.1	1	N	MC	<input checked="" type="checkbox"/>
4	VF491643	8.C.2	C	2.3	3	Y	CR	<input checked="" type="checkbox"/>
5	VH239108	8.D.2	D	3.6	6	Y	CR	<input checked="" type="checkbox"/>
6	M800273	8.EE.6	A	1.1	1	Y	MC	<input checked="" type="checkbox"/>
7	M800291	8.EE.C.Int.1	A	1.2	2	Y	FIB, MC	<input checked="" type="checkbox"/>
8	M800330	8.D.3	D	3.3	3	Y	CR	<input checked="" type="checkbox"/>
9	M800103	8.G.8	A	1.1	1	Y	FIB	<input checked="" type="checkbox"/>
10	M800389	8.G.9	B	1.4	4	Y	FIB, MC	<input checked="" type="checkbox"/>

**Sequence:** The item order number as it appears in the released item set and answer key

**UIN:** A unique item number used to identify the item in the internal item bank

**Evidence Statements:** The evidence statement to which the item is aligned

**Sub-Claims:** The Sub-Claim to which the item is aligned

**Task Type:** Type I, II, or III. See the Informational Guides for more information

**Functionality:** MC – multiple choice; MS – multiple-select; FIB – fill-in-the-blank; CR – constructed response

Table 2: Grade 8 Released Item List with Answer Key

<b>Sequence</b>	<b>UIN</b>	<b>Evidence Statement</b>	<b>Points</b>	<b>Answer Key</b>
1	M800227	8.NS.1	1	<b>A</b>
2	M800399	8.NS.2	1	<b>B</b>
3	M800267	8.SP.2	1	<b>D</b>
4	VF491643	8.C.2	3	<b>See Rubric</b>
5	VH239108	8.D.2	6	<b>Part A: See Rubric; Part B: See Rubric; Part C: See Rubric</b>
6	M800273	8.EE.6	1	<b>C</b>
7	M800291	8.EE.C.Int.1	2	<b>Part A: A; Part B: 6</b>
8	M800330	8.D.3	3	<b>See Rubric</b>
9	M800103	8.G.8	1	<b>6.5</b>
10	M800389	8.G.9	4	<b>Part A: A; Part B: 24; Part C: range of answers, 267 to 268.2 Part D: D</b>

### Item #4 VF491643 Rubric

Score	Description
<b>3</b>	<p>This task has 2 scoring elements: Computation and Reasoning.</p> <p><b>Computation:</b> 1 point The response shows a correct transformation of the equation from the given form to a final equation that one number equals a different number. For example: “-9 = 9”.</p> <p><b>Reasoning:</b> 2 parts, each worth 1 point.</p> <p><b>Part 1:</b> The response starts with the initial equation and shows several steps in which the equation is transformed into equivalent equations, until the final equation where one number equals a different number. The valid chain of reasoning includes using the equal signs appropriately, and the conclusion that the final equation is false or incorrect which means that there is no solution to the original equation. For example:</p> $\begin{aligned} -3(3 - 4x) &= 5(x - 1) + 7(x + 2) \\ -9 + 12x &= 5x - 5 + 7x + 14 \\ -9 + 12x &= 12x + 9 \\ -9 &= 9 \end{aligned}$ <p><b>Part 2:</b> The response must indicate in the final equation that because one number equals a different number, the equation is false or incorrect. For example: “Since the steps in the chain of reasoning lead to a false statement, the equation has no solutions.” Or other valid response.</p> <p><b>Notes:</b> The response should receive credit for this part even if the student makes a numerical error, as long as the student interprets the final equation appropriately.</p> <p>If the computation step leads to a value of <math>x</math>, the response would not be able to receive credit for part 1 with valid chains of reasoning but could still receive the credit for part 2 if they say there is 1 solution.</p> <p>If the final computation step leads to a true statement that <math>9 = 9</math>, the student would be able to earn all 2 reasoning points by indicating that the final equation is true and that there are infinitely many solutions.</p> <p><b>Task score:</b> The task score is the sum of the points earned.</p>
<b>2</b>	Student response includes 2 of the above components.
<b>1</b>	Student response includes 1 of the above components.
<b>0</b>	The response is incorrect or irrelevant.

**Item #5 VH239108 Rubric Part A**

<b>Score</b>	<b>Description</b>
<b>2</b>	<p>Part A has 2 scoring elements: Modeling and Computation.</p> <p><b>Modeling:</b> 1 point</p> <ul style="list-style-type: none"> <li>The response shows a correct process for determining the approximate area of the patio using the areas of the square and the circle.</li> </ul> <p><b>Note:</b> The point is earned for a correct process regardless of whether a computation error is present in the response.</p> <p><b>Computation:</b> 1 point</p> <ul style="list-style-type: none"> <li>The response shows a correct value for the approximate area of the patio.</li> </ul> <p><b>Notes:</b> The point is earned for a correct answer regardless of whether a correct modeling process is present in the response.</p> <p>The point is earned for any answer in the range from 146.4 to 146.5, depending on the approximation of <math>\pi</math> that was used in the computation.</p> <p>The point can be earned for an answer in terms of pi, <math>225 - 25\pi</math>, or any equivalent answer.</p> <p><b>Sample Student Response:</b>            To find the area of the patio, first find the area of the square and subtract the area of the circular swimming pool. The square has a length and width of 15 meters, giving it an area of 15 meters <math>\times</math> 15 meters = 225 square meters. The swimming pool has a diameter of 10 meters, giving it a radius of 5 meters. The area of the pool is 5 meters <math>\times</math> 5 meters <math>\times</math> <math>\pi</math>, which is approximately 78.54 square meters. Subtracting the area of the circle from the area of the square gives a result of <math>225 - 78.54 = 146.46</math> square meters. This means that the approximate area of the patio is 146.46 square meters.</p> <p><b>Task Score:</b> The task score is the sum of the points earned.</p>
<b>1</b>	Response includes 1 of the above elements.
<b>0</b>	The response does not meet the criteria for 1 point (incorrect or irrelevant).

**Item #5 VH239108 Rubric Part B**

<b>Score</b>	<b>Description</b>
<b>2</b>	<p>Part B has 2 scoring elements: Modeling and Computation</p> <p><b>Modeling:</b> 1 point</p> <ul style="list-style-type: none"> <li>The response shows a correct process for determining the number of gallons of paint needed to cover the patio.</li> </ul> <p><b>Notes:</b> The point is earned for a correct process regardless of whether a computation error is present in the response.</p> <p>The point can be earned if an incorrect response from Part A is used as part of a correct modeling process.</p> <p><b>Computation:</b> 1 point</p> <ul style="list-style-type: none"> <li>The response shows a correct number of gallons of paint needed to cover the patio.</li> </ul> <p><b>Notes:</b> The point is earned for a correct answer regardless of whether a correct modeling process is present in the response.</p> <p>The point is earned only if the decimal part of the answer is correctly interpreted.</p> <p>This point can be earned if the correct number of gallons of paint is determined using an incorrect area calculated in Part A.</p> <p><b>Sample Student Response:</b>                      The area of the patio is approximately 146.46 square meters, and each gallon of paint covers an area of 32.5 square meters. To find the number of gallons of paint needed, divide the approximate area of the patio, 146.46 square meters, by the area that each gallon will cover, 32.5 square meters, to get approximately 4.5 gallons. Since only whole gallons can be purchased, at least 5 gallons of paint will need to be purchased to completely cover the area of the patio.</p> <p><b>Task Score:</b> The task score is the sum of the points earned.</p>
<b>1</b>	Response includes 1 of the above elements.
<b>0</b>	The response does not meet the criteria for 1 point (incorrect or irrelevant).

**Item #5 VH239108 Rubric Part C**

<b>Score</b>	<b>Description</b>
<b>2</b>	<p>Part C has 2 scoring elements: Modeling and Computation</p> <p><b>Modeling:</b> 1 point</p> <ul style="list-style-type: none"> <li>• The response shows a correct process for determining the cost of the paint needed to cover the patio.</li> </ul> <p><b>Notes:</b> The point is earned for a correct process regardless of whether a computation error is present in the response.</p> <p>The point can be earned if an incorrect response from Part B is used as part of a correct modeling process.</p> <p><b>Computation:</b> 1 point</p> <ul style="list-style-type: none"> <li>• The response shows a correct cost of the paint needed to cover the patio.</li> </ul> <p><b>Notes:</b> The point is earned for a correct answer regardless of whether a correct modeling process is present in the response.</p> <p>This point can be earned if the correct number of gallons of paint is determined using an incorrect area calculated in Part A.</p> <p><b>Sample Student Response:</b>            Each gallon of paint costs \$27.98, not including tax. To find the total cost of the paint needed to completely cover the patio, multiply 27.98 by 5 to get a total cost of \$139.90.</p> <p><b>Task Score:</b> The task score is the sum of the points earned.</p>
<b>1</b>	Response includes 1 of the above elements.
<b>0</b>	The response does not meet the criteria for 1 point (incorrect or irrelevant).

**Item #8 M800330 Rubric**

<b>Score</b>	<b>Description</b>
<b>3</b>	<p>Response includes the following elements:</p> <ul style="list-style-type: none"> <li>• Modeling component = 2 points               <ul style="list-style-type: none"> <li>○ Valid work or explanation to determine the total distance traveled from City P through the other cities and back to City P</li> <li>○ Valid work or explanation that supports today's speed was slower than the normal speed</li> </ul> </li> <li>• Computation component=1 point               <ul style="list-style-type: none"> <li>○ Valid estimation for the total distance traveled</li> </ul> </li> </ul> <p><b>Sample Student Response:</b></p> <p>Use the Pythagorean theorem to approximate <math>d</math>, the distance from City R to City P:</p> $a^2 + b^2 = c^2$ $200^2 + b^2 = 250^2$ $40000^2 + b^2 = 62500$ $b^2 = 22500$ $b = \sqrt{22500} = 150$ <p>The total distance is <math>200+250+150=600</math>.            The total distance the truck driver travels is about 600 miles.</p> <p>The rate of speed traveled today can be determined by dividing the distance from City R to City P by the time. The speed today is about <math>r = \frac{150}{2.5} = 60</math> miles per hour.</p> <p>The normal speed is 66 miles per hour. Therefore, today's speed of about 60 miles per hour is slower than the normal speed.</p>
<b>2</b>	Student response includes 2 of the 3 elements.
<b>1</b>	Student response includes 1 of the 3 elements.
<b>0</b>	Student response is incorrect or irrelevant.