Practice Test Answer and Alignment Document

Mathematics – Grade 8

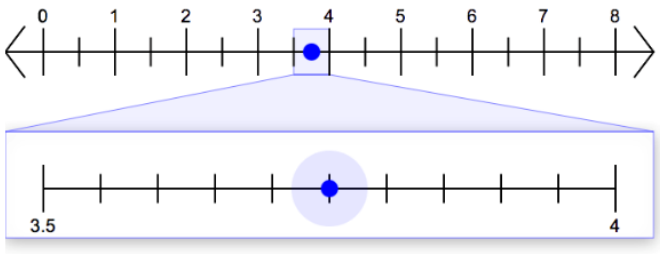
Online

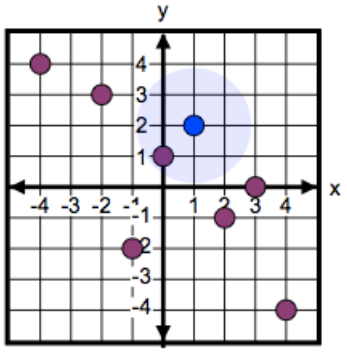
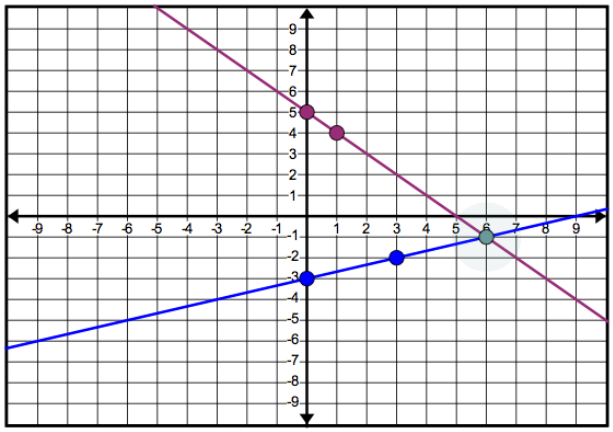
The following pages include the answer key for all machine-scored items, followed by the rubrics for the hand-scored items.

- The rubrics show sample student responses. Other valid methods for solving the problem can earn full credit unless a specific method is required by the item.
- In items where the scores are awarded for full and partial credit, the definition of partial credit will be confirmed during range-finding (reviewing sets of real student work).
- If students make a computation error, they can still earn points for reasoning or modeling.

Unit 1

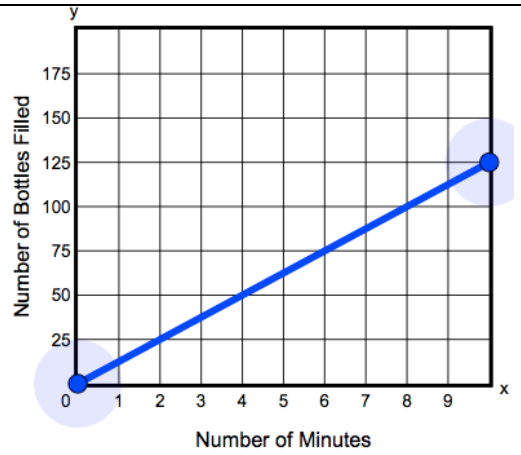
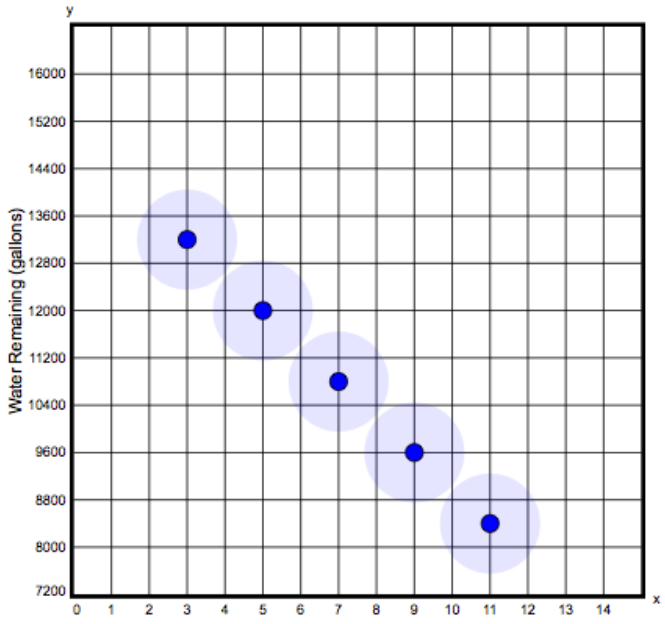
Item Number	Answer Key	Evidence Statement Key/Content Scope
1.	The response is correct as long as 8 and 10 are input values and 1 and 5 are output values. For example: Input: 1, 8, 5, 10 Output: 4, 6, 1, 5	8.F.1-1
2.	-1	8.EE.7.b

<table>
<tr><td>3.</td><td>
<table>
<tr><th>Interval</th><th>Increasing</th><th>Decreasing</th><th>Neither Increasing nor Decreasing</th></tr>
<tr><td>$-7 < x < -3$</td><td>☑</td><td>☐</td><td>☐</td></tr>
<tr><td>$-3 < x < 1$</td><td>☑</td><td>☐</td><td>☐</td></tr>
<tr><td>$-1 < x < 1$</td><td>☐</td><td>☑</td><td>☐</td></tr>
<tr><td>$1 < x < 3$</td><td>☑</td><td>☐</td><td>☐</td></tr>
<tr><td>$3 < x < 5$</td><td>☐</td><td>☑</td><td>☐</td></tr>
<tr><td>$5 < x < 7$</td><td>☐</td><td>☐</td><td>☑</td></tr>
</table>
</td><td>8.F.5-1</td></tr>
<tr><td>4.</td><td> 
</td><td>8.NS.2</td></tr>
<tr><td>5.</td><td>Part A: D
Part B: C</td><td>8.G.3</td></tr>
<tr><td>6.</td><td>C</td><td>8.EE.2</td></tr>
<tr><td>7.</td><td>(10, −2)</td><td>8.EE.8b-1</td></tr>
<tr><td>8.</td><td>
<table>
<tr><th>function</th><th>$y = 7 \times 4x$</th><th>$y = (2x+5)^2$</th><th>$y = 10x^2$</th><th>$y = 5x - 3$</th><th>$y = \frac{x}{2}$</th><th>$y = 2x^3 + 1$</th></tr>
<tr><td>linear</td><td>◉</td><td>○</td><td>○</td><td>◉</td><td>◉</td><td>○</td></tr>
<tr><td>non-linear</td><td>○</td><td>◉</td><td>◉</td><td>○</td><td>○</td><td>◉</td></tr>
</table>
</td><td>8.F.3-2</td></tr>
<tr><td>9.</td><td>The graph of the system consists of lines that have [exactly one point] of intersection.
Therefore, the system has [exactly one] solution.</td><td>8.EE.8a</td></tr>
<tr><td>10.</td><td>D</td><td>8.NS.1</td></tr>
<tr><td>11.</td><td>A, C, F</td><td>8.G.1a</td></tr>
<tr><td>12.</td><td>Part A:
Figure 1 can be transformed onto figure 2 by
[a reflection across the x -axis] followed by
[a translation 3 units to the right].
Part B:
Figure 1 can be transformed onto figure 3 by
[a rotation 90 ° clockwise about the or] followed by
[a reflection across the x-axis].</td><td>8.G.2</td></tr>
<tr><td>13.</td><td>There are multiple correct responses. For example:</td><td>8.F.1-2</td></tr>
</table>

		
14.	B, E	8.EE.1
15.		8.EE.8b-2
16.	A	8.SP.2
17.	300	8.EE.3

Unit 2

Item Number	Answer Key	Evidence Statement Key / Content Scope

1.		8.EE.5-1
2.	Part A: D Part B: 4.5 or equivalent	8.EE.C.Int.1
3.	See rubric	8.D.3/8.EE.5
4.	B, F	8.F.2
5.	Part A: see rubric Part B: see rubric	8.C.3.3/8.G.5
6.	Part A:  Part B: C Part C: D Part D: A	8.F.4
7.	Part A: B Part B: $\frac{1}{3}$	8.G.9
8.	Part A: C Part B: see rubric	8.C.6/7.EE.1

	Part C: see rubric	
9.	B, C	8.SP.4
10.	12	8.G.7-1

Unit 3

Item Number	Answer Key	Evidence Statement Key/Content Scope
1.	The rate of change in Proportion A is 2.5 less than the rate of change in Proportion B.	8.EE.5-2
2.	Part A: see rubric Part B: see rubric	8.C.5.2/8.G.2 & 8.G.4
3.	Part A: C Part B: 8	8.SP.3
4.	See rubric	8.D.1/8.EE.5
5.	Part A: A, E Part B: see rubric	8.C.1.2/8.EE.8
6.	A, B, C, E	8.EE.6-1
7.	Part A: see rubric Part B: see rubric	8.D.2/7.RP.3 & 7.EE.3
8.	Part A: 19 Part B: In the system of equations, x represents the cost, in dollars, of each t-shirt and y represents the cost, in dollars, of each sweatshir . Part C: (8, 11) Part D: 30	8.EE.8c
9.	Least Rate of Change: Function B Greatest Rate of Change: Function A, Function C	8.F.2

Rubrics start on the next page.

Unit 2 #3 Rubric	
Score	**Description**
3	Student response includes each of the following 3 elements. • Approximate miles per gallon for car M, from 25 to 27 • Approximate miles per gallon for car P, from 28 to 33 • Valid work shown or explanation given for each answer Sample Student Response: Car M gets approximately 26.5 miles per gallon. I found this by finding an average unit rate for the table for Car M. $50.4 + 80.5 + 181.3 + 137.5 = 449.7$ Total Miles $2 + 3 + 7 + 5 = 17$ Total Gallons $\frac{449.7}{17} \approx 26.5$ Miles Per Gallon Car P gets approximately 31.7 miles per gallon. I found this by approximating the points in the graph as (1, 30), (2, 65), (3, 90), (4, 130) and (5, 160). Then I found the average unit rate for these points. $30 + 65 + 90 + 130 + 160 = 475$ Total Miles $1 + 2 + 3 + 4 + 5 = 15$ Total Gallons $\frac{475}{15} \approx 31.7$ Miles Per Gallon
2	Student response includes 2 of the 3 elements.
1	Student response includes 1 of the 3 elements.
0	Student response is incorrect or irrelevant.

Unit 2 #5 Rubric Part A	
Score	**Description**
1	Student response includes the following element. • Correct explanation of why triangle *RTS* is similar to triangle *VTU* Sample Student Response: $\angle SRT$ and $\angle UVT$ are alternate interior angles, and therefore congruent. $\angle RST$ and $\angle TUV$ are alternate interior angles, and therefore

	congruent. $\angle RTS$ and $\angle UTV$ are vertical angles, and therefore congruent. Triangle *RTS* is similar to triangle *VTU* by the angle-angle criterion. Note: Two of the three angle statements must be stated for the student to get one point.
0	Student response is incorrect or irrelevant.

Unit 2 #5 Rubric Part B	
Score	**Description**
2	Student response includes each of the following 2 elements. • Determines $m\angle SRT + m\angle TUV = 108°$ • Correct work shown or explanation given Sample Student Response: Angles *TUV* and *RST* are alternate interior angles so $m\angle TUV = m\angle RST$. Since $m\angle RTS + m\angle STV = 180$ and $m\angle STV = 108°$, $m\angle RTS = 180° - 108° = 72°$. The measures of the angles of a triangle sum to 180° so, $m\angle SRT + m\angle RST = 180° - m\angle RTS$ $= 180° - 72°$ $= 108°$ So $m\angle SRT + m\angle TUV = m\angle SRT + m\angle RST = 108°$.
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

Unit 2 #8 Rubric Part A	
Score	**Description**
1	Machine Scored: C

Unit 2 #8 Rubric Part B	
Score	**Description**
2	Student response includes each of the following 2 elements. • Writes equivalent expressions • Uses a correct series of reasoning to determine that the first expression is always greater than the second expression Sample Student Response:

	I need to compare the expressions, so I will rewrite them by distributing and combining like terms. $\frac{1}{2}(7x + 48)$ $\quad$ $-\left(\frac{1}{2}x - 3\right) + 4(x + 5)$ $\frac{7}{2}x + 24$ $\quad$ $-\frac{1}{2}x + 3 + 4x + 20$ $\frac{7}{2}x + 23$ When I compare $\frac{7}{2}x + 24$ to $\frac{7}{2}x + 23$, I can subtract $\frac{7}{2}x$ from both expressions since they give the same value and just compare 24 to 23. Since 24 is always greater than 23, the expression $\frac{1}{2}(7x + 48)$ is always greater than the expression $-\left(\frac{1}{2}x - 3\right) + 4(x + 5)$. Notes: • The student does not need to show both equivalent expressions, but can earn this point if it is clear from their explanation that they found equivalent expressions. For example, if the student explains that the only difference between the two expressions is that one has 23 and the other has 24, it is clear that they have found equivalent expressions. • The student may receive a total of 1 point if he or she computes the correct answer, but shows no work or insufficient work to indicate a correct reasoning process.
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

Unit 2 #8 Rubric Part C	
Score	**Description**
1	Student creates an expression using the variable x that is always greater than the two given expressions.
0	Student response is incorrect or irrelevant.

Unit 3 #2 Rubric Part A	
Score	**Description**
2	Student response includes each of the following 2 elements. • Identifies the transformation as a reflection • Identifies the reflection is across the line $x = 1$ Sample Student Response:

	The transformation from *ABC* to *A'B'C'* is a reflection across the line $x = 1$. Note: The student can receive 1 point for part A if they describe a correct sequence of transformations instead of a single transformation.
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

Unit 3 #2 Rubric Part B	
Score	**Description**
2	Student response includes each of the following 4 elements. • Identifies the transformation as a reflection • Identifies the reflection is across the *x*-axis • Identifies the transformation as a dilation with scale factor of 2 • Identifies the center of dilation as point *C'* Sample Student Response: To show the triangles are similar, dilate triangle *A'B'C'* using a scale factor of 2 with *C'* as the center of dilation. Then reflect the triangle across the x-axis.
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

Unit 3 #4 Rubric	
Score	**Description**
3	Student response includes each of the following 3 elements. • Finds unit rates for both companies • Valid work or explanation of how unit rates are found for each company • Finds the cost of buying 2,375 kilowatt-hours of electricity from the least expensive company Sample Student Response: The unit rate for Company P is \$0.12 per kilowatt-hour of electricity. When I divide the cost by the number of kilowatt-hours of electricity I get the unit rate. $150.00 \div 1250 = 0.12$ $198.00 \div 1650 = 0.12$

	The slope of a linear function can be considered the function's rate. The unit rate for Company M is $0.15 per kilowatt-hour of electricity. It costs $285.00 to buy 2,375 kilowatt-hours of electricity from Company P.
2	Student response includes 2 of the 3 elements.
1	Student response includes 1 of the 3 elements.
0	Student response is incorrect or irrelevant.

Unit 3 #5 Rubric Part A	
Score	**Description**
1	Machine Scored: A, E

Unit 3 #5 Rubric Part B	
Score	**Description**
2	Student response includes each of the following 2 elements. • Explanation for no solutions • Explanation for infinitely many solutions Sample Student Response: Lines with the same slope could have different *y*-intercepts which would make them parallel lines. Because parallel lines never intersect, there would be no common point of intersection on the lines, and therefore, no solution to the system of equations. Lines with the same slope could also have the same *y*-intercept which would make them be the same line. Because lines that are the same intersect at all possible points, there would be infinitely many common points of intersection on the lines, and therefore infinitely many solutions to the system of equations. Notes: • The student cannot receive more than 1 point for reasoning if he or she includes an explanation for either "1 solution", "2 solutions", or "3 solutions" as being a correct answer.
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

Unit 3 #7 Rubric Part A	
Score	**Description**

2	Student response includes each of the following 2 elements: • Correct amount of each payment, \$80.73 • Valid work shown or explanation given Sample Student Response: The discounted price is 75% of the original price, so I need to multiply the original price by 0.75. Then, I will multiply that amount by 0.08 to determine the sales tax. Adding the two together will give me the total price of the computer. I then divide the total price of the computer by 6 to determine the six monthly payments. $\$598.00 \times 0.75 = \$448.50$ $\$448.50 \times 0.08 = \$35.88$ $\$448.50 + \$35.88 = \$484.38$ total cost $\$484.38 \div 6 = \$80.73$ per month
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

Unit 3 #7 Rubric Part B	
Score	**Description**
4	Student response includes each of the following 4 elements. • Correct total price of the different computer, \$602.64 • Valid work or explanation given • Correct original price of the different computer, \$930.00 • Valid work or explanation given Sample Student Response: The total cost of the different computer is \$602.64 and the original price is \$930.00. The tax is \$44.64, which is 8% of the sale price of the computer, d. $\frac{44.64}{d} = \frac{8}{100}$ $4464 = 8d$ $d = 558.00$ The price of the computer after discount and sales tax is \$602.64. $558.00 + 44.64 = 602.64$ The sale price is 60% of the original price, p. $\frac{558.00}{p} = \frac{60}{100}$ $55800 = 60p$ $p = 930.00$

3	Student response includes 3 of the 4 elements.
2	Student response includes 2 of the 4 elements.
1	Student response includes 1 of the 4 elements.
0	Student response is incorrect or irrelevant.