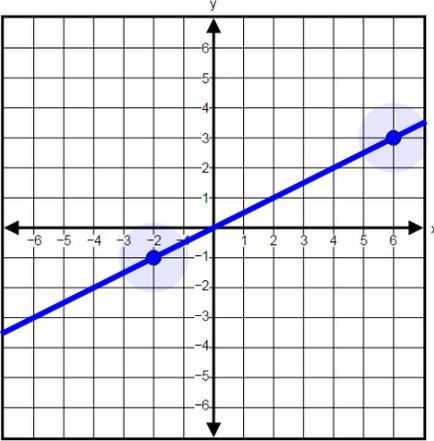


The following pages include the answer key for all machine-scored items, followed by the rubrics for the hand-scored items.

- 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.

Item Number	Answer Key	Evidence Statement Key
1.	A	8.EE.1
2.	4	8.EE.7b
3.	C, D	8.F.1-1
4.		8.F.1-2
5.	<input data-bbox="334 1556 610 1612" type="text" value="equal to"/> <input data-bbox="334 1629 610 1686" type="text" value="equal to"/>	8.G.1a
6.	D	8.G.1b
7.	Part A: A Part B: B	8.G.4

8.	C	8.EE.4-1						
9.	<table border="1"> <tr> <td><math>r</math> and <math>s</math></td> <td><math>s</math> and <math>t</math></td> <td><math>r</math> and <math>t</math></td> </tr> <tr> <td>(2,6)</td> <td>(-4,-6)</td> <td>(4,2)</td> </tr> </table>	$r$ and $s$	$s$ and $t$	$r$ and $t$	(2,6)	(-4,-6)	(4,2)	8.EE.8a
$r$ and $s$	$s$ and $t$	$r$ and $t$						
(2,6)	(-4,-6)	(4,2)						
8.	C	8.EE.4-1						
9.		8.EE.8a						
10.	A	8.EE.5-1						
11.	C	8.EE.4-2						
12.	See rubric	8.C.2						
13.	Part A: see rubric Part B: see rubric	8.C.6						
14.	See rubric	8.D.1						
15.	Part A: see rubric Part B: see rubric	8.C.3.3						
16.	Part A: see rubric Part B: see rubric	8.C.6						
17.	Part A: see rubric Part B: see rubric Part C: see rubric	8.D.2						
18.	Part A: see rubric Part B: see rubric Part C: see rubric	8.D.3						

#12 Rubric

Score	Description
3	<p>Student response includes the following 3 elements.</p> <ul style="list-style-type: none"><li>• <b>Computation component</b> = 1 point<ul style="list-style-type: none"><li>○ Correct conclusion about the equation with an appropriate explanation of why the conclusion is valid</li></ul></li><li>• <b>Reasoning component</b> = 2 points<ul style="list-style-type: none"><li>○ Correctly uses the distributive property to simplify both sides of the equation</li><li>○ Correctly combines like terms, resulting in a false equation in which the variable has been eliminated and two non-equal numbers appear on opposite sides of the equal sign</li></ul></li></ul> <p>Sample Student Response:</p> $-2(11-12x) = -4(1-6x)$ $-22+24x = -4 +24x$ <p>Subtracting 24x from each side</p> $-22+24x -24x = -4 +24x -24x$ $-22 = -4$ <p>This is impossible, since -22 is not equal to -4. Therefore, there is no solution to the equation.</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.

# 13 Part A

Score	Description
2	<p>Student response includes the following 2 elements.</p> <ul style="list-style-type: none"> <li>• <b>Computation component</b> = 1 point <ul style="list-style-type: none"> <li>○ Determines both percentage increases</li> </ul> </li> <li>• <b>Reasoning component</b> = 1 point <ul style="list-style-type: none"> <li>○ Correctly reasons that the student's claim is justified</li> </ul> </li> </ul> <p>Sample Student Response:</p> <p>Percent increase from 1998 to 2000 is <math>(1.354 - 1.291)/1.291 \approx 0.0488</math>.  Percent increase from 2011 to 2013 is <math>(4.069 - 3.874)/3.874 \approx 0.0503</math>.  The percent increase for both periods is about 5%, so the student's claim can be justified.</p>
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

#13 Part B

Score	Description
2	<p>Student response includes the following 2 elements.</p> <ul style="list-style-type: none"> <li>• <b>Computation component</b> = 1 point <ul style="list-style-type: none"> <li>○ Determines the percent error of the prediction, 0.8%</li> </ul> </li> <li>• <b>Reasoning component</b> = 1 point <ul style="list-style-type: none"> <li>○ Correctly reasons that the newspaper's claim is correct</li> </ul> </li> </ul> <p>Sample Student Response:</p> <p>The percent error of the prediction was 0.8%.  <math>\frac{(4.10 - 4.069)}{4.069} = 0.008</math>  Since 0.8% is less than 2%, the newspaper's claim was correct.</p>
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

## #14 Rubric

Score	Description
3	<p>Student response includes the following 3 elements.</p> <ul style="list-style-type: none"><li>• <b>Computation component</b> = 1 point<ul style="list-style-type: none"><li>○ Determines the unit price for both gas stations</li></ul></li><li>• <b>Modeling component</b> = 2 points<ul style="list-style-type: none"><li>○ Determines that gas station P charges more for gasoline</li><li>○ Correctly models determining the unit prices and the gas station that charges more for gasoline.</li></ul></li></ul> <p>Sample Student Response:</p> <p>Based on the unit prices, Gas Station P charges more for gasoline. The unit price for Gas Station P is \$4.00 per gallon since the constant linear graph for Gas Station P shows the point (5, 20), which means it costs \$20 for 5 gallons of gas. The table for Gas Station M shows that 10 gallons cost \$38, so the unit price for Gas Station M is <math>\frac{38}{10} =</math> \$3.80 per gallon.</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.

#15 Part A

Score	Description
1	<p>Student response includes the following element.</p> <ul style="list-style-type: none"><li>• <b>Reasoning component</b> = 1 point<ul style="list-style-type: none"><li>○ Correctly reasons why <math>\angle KJN</math> and <math>\angle LJM</math> are both congruent</li></ul></li></ul> <p>Sample Student Response:</p> <p><math>\angle KJN</math> is congruent to <math>\angle LJM</math> because they are the same angle since they exactly overlap.</p>
0	Student response is incorrect or irrelevant.

#15 Part B

Score	Description
2	<p>Student response includes the following element.</p> <ul style="list-style-type: none"><li>• <b>Reasoning component</b> = 2 points<ul style="list-style-type: none"><li>○ correct pair of corresponding congruent angles, <math>\angle JKN</math> and <math>\angle JLM</math> or <math>\angle JNK</math> and <math>\angle JML</math></li><li>○ correctly reasons why the given pair of angles is congruent</li></ul></li></ul> <p>Sample Student Response:</p> <p><math>\angle JKN</math> is congruent to <math>\angle JLM</math> OR <math>\angle JNK</math> is congruent to <math>\angle JML</math></p> <p>Either line segment <math>JL</math> or line segment <math>JM</math> is a transversal to the parallel line segments <math>KN</math> and <math>LM</math>. When two parallel lines are intersected by a transversal, corresponding angles formed by the transversal are congruent. The pair of angles is also corresponding in terms of their locations in <math>\triangle KJN</math> and <math>\triangle LJM</math>.</p>
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

#16 Part A

Score	Description
2	<p>Student response includes the following element.</p> <ul style="list-style-type: none"><li>• <b>Reasoning component</b> = 2 points<ul style="list-style-type: none"><li>○ Determines whether the claim is always true, sometimes true, or never true</li><li>○ Correctly reasons that the claim is sometimes true</li></ul></li></ul> <p>Sample Student Response:</p> <p>Cary's claim is sometimes true. For example, when 4 is substituted for m, <math>-5 + 4 = -1</math>. If the value of m is a number that is greater than 5, such as 6 where <math>-5 + 6 = 1</math>, then the expression results in a positive number. (Accept alternative valid explanations.)</p>
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

#16 Part B

Score	Description
2	<p>Student response includes the following element.</p> <ul style="list-style-type: none"><li>• <b>Reasoning component</b> = 2 points<ul style="list-style-type: none"><li>○ Determines whether the claim is always true, sometimes true, or never true</li><li>○ Correctly reasons that the claim is always true</li></ul></li></ul> <p>Sample Student Response:</p> <p>Phillip's claim is always true because p and <math>-p</math> are opposites. The sum of opposites is always 0. That makes the expression <math>0 + 5</math> which will always be positive 5. The value of p does not matter. <math>7 + 5 + (-7) = 0 + 5 = 5</math> and <math>-3 + 5 + -(-3) = -3 + 5 + 3 = 0 + 5 = 5</math> and <math>0 + 5 + 0 = 5</math> since the opposite of 0 is 0. (Accept alternative valid explanations.)</p>
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

#17 Part A	
Score	Description
<b>1</b>	<p>Student response includes the following element.</p> <ul style="list-style-type: none"> <li>• <b>Computation component</b> = 1 point <ul style="list-style-type: none"> <li>○ Machine Scored: Selects only the following two options: 1/24 cup of milk is used to make each muffin</li> <li>1 cup of milk is used to make every 24 muffins</li> </ul> </li> </ul>
<b>0</b>	Student response is incorrect or irrelevant.
#17 Part B	
Score	Description
<b>3</b>	<p>Student response includes the following 3 elements.</p> <ul style="list-style-type: none"> <li>• <b>Computation component</b> = 1 point <ul style="list-style-type: none"> <li>○ Indicates that 32 batches of muffins can be made with 1 gallon of milk</li> </ul> </li> <li>• <b>Modeling component</b> = 2 points <ul style="list-style-type: none"> <li>○ Correct strategy to find the total number of cups in a gallon</li> </ul> <p style="margin-left: 40px;">Note: Providing the correct number of cups in a gallon is sufficient to satisfy this element.</p> <ul style="list-style-type: none"> <li>○ Correct strategy to find the number of batches of muffins that can be made with 1 gallon of milk</li> </ul> </li> </ul> <p>Sample Student Response:</p> <p style="margin-left: 40px;">There are 2 cups in a pint, 2 pints in a quart, and 4 quarts in a gallon, so there are <math>2 \times 2 \times 4 = 16</math> cups in a gallon.</p> <p style="margin-left: 40px;">One cup of milk is needed for 24 muffins, so 1 gallon of milk can make <math>24 \times 16 = 384</math> muffins. This means that <math>384 \div 12 = 32</math> batches of muffins can be made using 1 gallon of milk.</p> <p>Note: The student may show modeling using only equations. If the equations shown represent a valid modeling process, credit should be awarded.</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.

#17 Part C	
Score	Description
<b>2</b>	<p>Student response includes the following elements.</p> <ul style="list-style-type: none"> <li>• <b>Computation component</b> = 1 point <ul style="list-style-type: none"> <li>○ Indicates 7.5 gallons of milk are needed to make 96 muffins every day for 30 days</li> </ul> </li> <li>• <b>Modeling component</b> = 1 point <ul style="list-style-type: none"> <li>○ Correct strategy to find the number of gallons of milk needed to make 96 muffins each day for 30 days</li> </ul> </li> </ul> <p>Sample Student Response:</p> <p>The bakery makes <math>96 \div 12 = 8</math> batches of muffins each day. In 30 days, the bakery makes <math>30 \times 8 = 240</math> batches. Since 32 batches can be made with 1 gallon of milk, 240 batches can be made with <math>240 \div 32 = 7.5</math> gallons of milk.</p> <p>Notes:</p> <ul style="list-style-type: none"> <li>○ The student may receive modeling points if the student shows a sufficient modeling process for some or all of the parts indicated but makes one or more computational errors resulting in incorrect answer(s).</li> <li>○ The student may receive computation points if he or she computes the correct answer(s) to one or all of the parts but shows no work or insufficient work to indicate a correct modeling process.</li> <li>○ The student may not receive more than 2 total points (across all parts) for modeling if the explanations, while sufficient to indicate that the student has a correct process, contain nonsense statements.</li> </ul>
<b>1</b>	Student response includes 1 of the 2 elements.
<b>0</b>	Student response is incorrect or irrelevant.

#18 Part A	
Score	Description
<b>1</b>	<p>Student response includes the following element.</p> <ul style="list-style-type: none"> <li>• <b>Computation component</b> = 1 point <ul style="list-style-type: none"> <li>○ Graphs a line that passes through the points (0, 0) and (6, 90)</li> </ul> </li> </ul> <p>Note: The student may choose any two points on the correct line to receive credit.</p>
<b>0</b>	Student response is incorrect or irrelevant.
#18 Part B	
Score	Description
<b>1</b>	<p>Student response includes the following element.</p> <ul style="list-style-type: none"> <li>• <b>Modeling component</b> = 1 point <ul style="list-style-type: none"> <li>○ Explains what the slope of the line represents</li> </ul> </li> </ul> <p>Sample Student Response:</p> <p style="padding-left: 40px;">The slope of the line represents the amount of money that is saved each week for the first six weeks.</p> <p>Notes:</p> <ul style="list-style-type: none"> <li>○ The student does not have to mention what the slope of the line is in order to get the modeling point.</li> <li>○ The student may get 1 modeling point for a correct explanation of what the slope represents that references an incorrect slope based on his or her response to Part A.</li> </ul>
<b>0</b>	Student response is incorrect or irrelevant.

#18 Part C

Score	Description
1	<p>Student response includes the following element.</p> <ul style="list-style-type: none"><li>• <b>Modeling component</b> = 1 point<ul style="list-style-type: none"><li>○ Shows or explains how to use the line drawn in Part A to determine the number of weeks it will take for Mindy to have \$150 saved and states the assumption that the money is still saved at a constant rate after week 6</li></ul></li></ul> <p>Sample Student Response:</p> <p>I can extend the line to when <math>y = 150</math> to find the number of weeks it takes Mindy to save \$150. By doing that, I assume that the rate of change in the amount of money saved each week is still constant after week 6.</p> <p>Notes:</p> <ul style="list-style-type: none"><li>○ Many valid responses are possible. As long as it is clear that the student knows the rate at which Mindy saves money is assumed to be constant and how to determine the number of weeks given a dollar amount saved, credit should be awarded.</li><li>○ The student does not have to determine the number of weeks in order to get the modeling point; the student only needs to explain how to determine the number of weeks.</li><li>○ The student may receive 1 modeling point for a correct explanation that references an incorrect slope based on his or her response to Part A.</li></ul>
0	Student response is incorrect or irrelevant.