MPS Learning Target – Algebraic Relationships

- Analyze, identify, and extend patterns and functional relationships in sequences, tables, and graphs, and describe graphs of real-world situations.
- Represent problem situations with mathematical models, justify solutions to equations with letter-variables, and compare expressions using order of operations and numerical properties.

1.) Circle all the correct rules for the data on the table and complete the table.

<table>
<thead>
<tr>
<th>s</th>
<th>w</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.5</td>
<td>5.5</td>
</tr>
<tr>
<td>15/2</td>
<td>15/2</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>3/4</td>
<td>14 1/4</td>
</tr>
<tr>
<td>-10</td>
<td></td>
</tr>
</tbody>
</table>

A.) $w - 15 = s$
B.) $w + s = 15$
C.) $15 + w = s$
D.) $15 - w = s$
E.) $15 = s + w$

Explain your reasoning. _______________________________________________________
___________________________________________________________________________
___________________________________________________________________________

2.) Circle the rule for the data on the table.

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-3</td>
</tr>
<tr>
<td>1</td>
<td>-1</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

A.) $3x + 2 = y$
B.) $3x - 2 = y$
C.) $2x + 3 = y$
D.) $2x - 3 = y$
E.) $x - 3 = y$

3.) Michael rides his bicycle $x$ miles the first day, y miles the second day, and $z$ miles the third day. Which of the following expressions represents the average number of miles per day that Michael travels?

A.) $xyz$
B.) $3(xyz)$
C.) $x + y + z$
D.) $3(z + y + z)$
E.) $(x + y + z)/3$
4a.) Draw in the 4th figure.

![Diagram of 4 figures: First, Second, Third, Fourth, Fifth]

4b.) Draw what the 13th figure would look like in the box below.

![Blank box for drawing the 13th figure]

5.) Pick a real world situation that this graph would represent. Explain why your situation is represented by the graph. Give the graph a title and label each axis on the graph including units.

![Graph with labeled axes: Time on the x-axis, units on the y-axis]

___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________

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6.) The graph below shows the cost of making a phone call with two different companies
(Company A and Company B).

![Phone Calls Cost Comparison graph]

a. What is the cost of a 4-minute call using Company B?___________
b. What is the cost per minute for a call using Company B?___________
c. Complete the table below.

<table>
<thead>
<tr>
<th>Number of Minutes</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company A</td>
<td>0</td>
<td>.15</td>
<td>.30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.15</td>
<td>.25</td>
</tr>
</tbody>
</table>
d.) Describe the rules you used to extend the table.

e.) How much will a 200 minute phone call cost for company A? Write an equation and solve the equation to determine how much money you spent.

f.) Write an expression (formula) that tells the cost of any phone call for Company B. Use the variable “m” to represent the number of minutes in your math expression.

7.) Insert the following symbols in the number sentence below when x = 3.
(>, <, =, +)

- 5x + 2 ___ 15
- 9 ___ x + 2x
- 4x – 3 ___ 12
- 7 ___ 2x – 4

8.) Extend the pattern below.

1/2    7/16   3/8   5/16   _____   _____   _____

9.) 3^3 + 4(8 –5) / 6 = _____

A.) 6.5  
B.) 11  
C.) 27.5 
D.) 29  
E.) 34.16

10.) Write as many equivalent expressions as you can using the commutative property.

35 = 5 x ( 3 + 4)