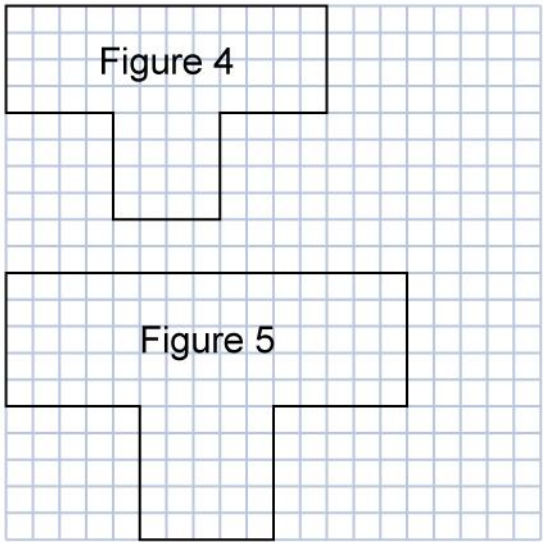
Math Lab: Investigating Linear Relations Possible Solutions

Part A: Investigating Graphs and Tables

1. The student's Figure 4 and Figure 5 should look like the following.

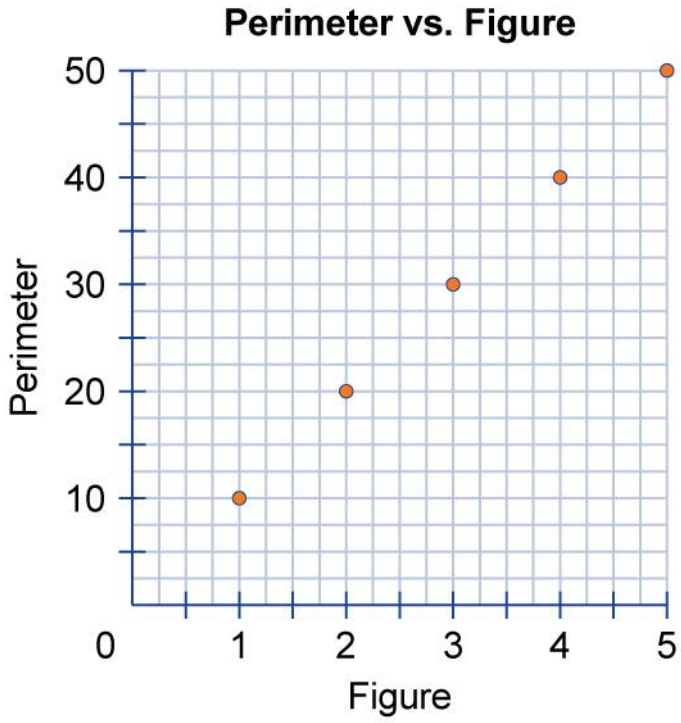


2. The following chart is the correct answer.

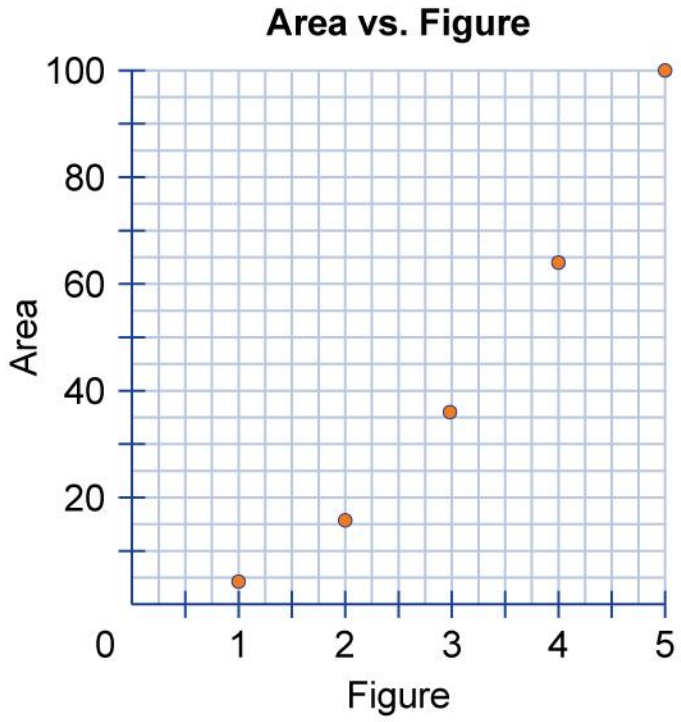
Figure	Width	Perimeter	Area
1	3	10	4
2	6	20	16
3	9	30	36
4	12	40	64
5	15	50	100

3. The completed graphs should look like the following.

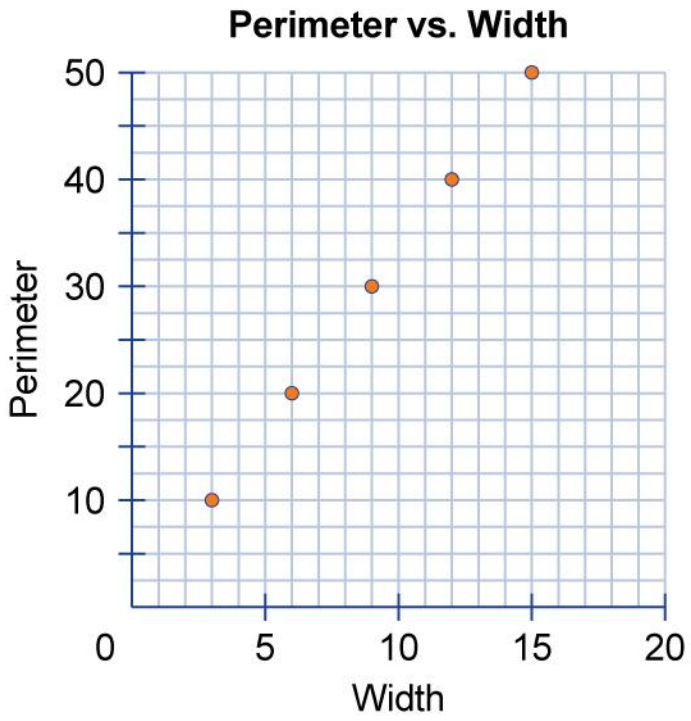
a.



b.



c.



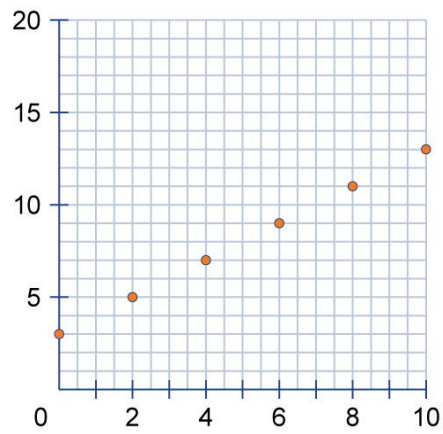
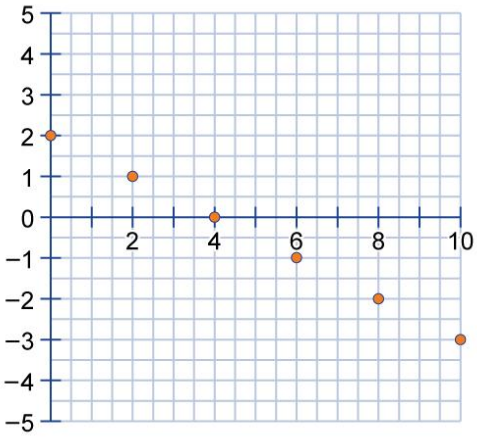
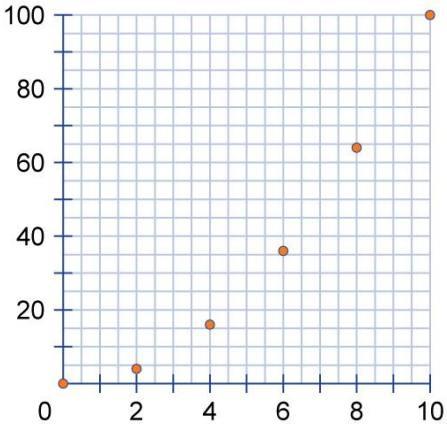
Analysis

4. The graphs whose points lie on a straight line are the Perimeter vs. Figure graph and the Perimeter vs. Width graph.

5. The tables for the linear relations are different in that the difference between consecutive numbers going down each column is consistent.

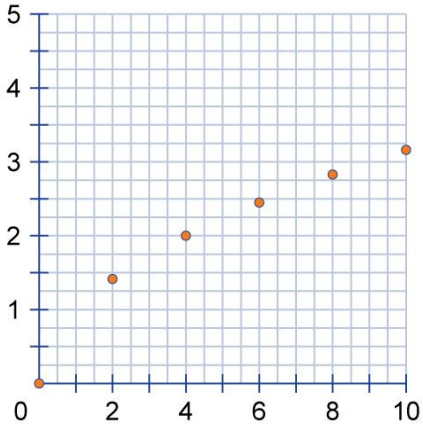
Part B: Investigating Equations

6.

Equation	Table	Graph
$y = x + 3$	<table><tr><th>x</th><th>y</th></tr><tr><td>0</td><td>3</td></tr><tr><td>2</td><td>5</td></tr><tr><td>4</td><td>7</td></tr><tr><td>6</td><td>9</td></tr><tr><td>8</td><td>11</td></tr><tr><td>10</td><td>13</td></tr></table>	
$y = -\frac{1}{2}x + 2$	<table><tr><th>x</th><th>y</th></tr><tr><td>0</td><td>2</td></tr><tr><td>2</td><td>1</td></tr><tr><td>4</td><td>0</td></tr><tr><td>6</td><td>−1</td></tr><tr><td>8</td><td>−2</td></tr><tr><td>10</td><td>−3</td></tr></table>	
$y = x^2$	<table><tr><th>x</th><th>y</th></tr><tr><td>0</td><td>0</td></tr><tr><td>2</td><td>4</td></tr><tr><td>4</td><td>16</td></tr><tr><td>6</td><td>36</td></tr><tr><td>8</td><td>64</td></tr><tr><td>10</td><td>100</td></tr></table>	

$y = \sqrt{x}$		

x	y
0	0
2	1.414
4	2
6	2.449
8	2.828
10	3.162



Analysis

7. An equation forms a straight line if either of the following is true:

   - The equation takes the form $y = mx + b$. You will learn more about this later.
   - The equation is a first-degree equation involving only two variables.