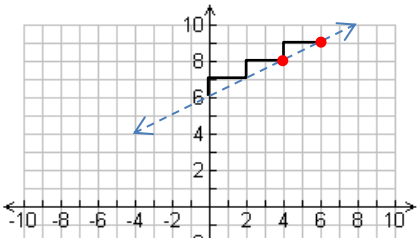
Name: _____

EXTENSION: Writing a Linear Equation through Two Points

Example: Write an equation that goes through the points (4, 8) and (6, 9).

METHOD 1: Graph it



- **From the graph, we can see that the slope between the points is ½.**
- **If we extend the pattern, we see that the y-intercept will be 6.**
- **Thus, the equation is $y = \frac{1}{2}x + 6$.**

Use the graphing method to find an equation in the form y = mx + b through the points.

1) (1, 4) and (2, 7) _____

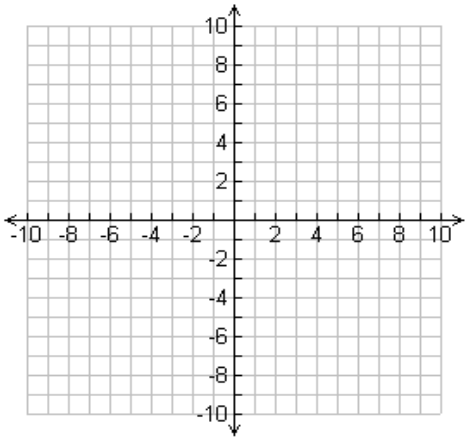
2) (-9, 9) and (-6, 7) _____

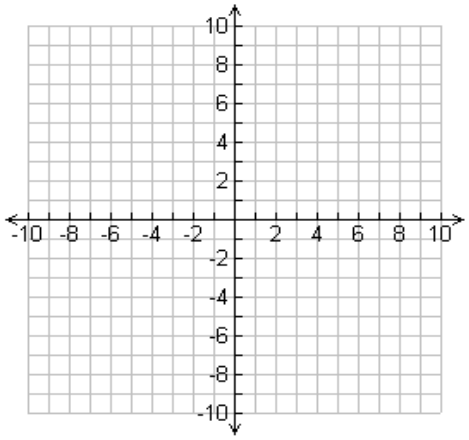
3)(4, 2) and (6, -2) _____

4) (3, 8) and (7, 8) _____

5) (5, -1) and (9, 3) _____

6) (-8, 9) and (6, 2) _____





METHOD 2: Without a graph

Step 1: Using our same points of (4, 8) and (6, 9): Use the slope formula $\left(\frac{y_2-y_1}{x_2-x_1}\right)$ to find the slope: $\frac{9-8}{6-4} = \frac{1}{2}$

Step 2: The slope is $\frac{1}{2}$, so you know the equation will be $y = \frac{1}{2}x +$ ____. Now we need to figure out b.

Step 3: We need to make the equation work with the numbers we have. Think of it as "guess my rule."

x	y
4	8
6	9

We know that the x is multiplied by $\frac{1}{2}$. 4 times $\frac{1}{2}$ plus what equals 8?
Half of 4 is 2, so to get 8, you would need to add 6.

Step 4: The equation is $y = \frac{1}{2}x + 6$. Double check with your other point, (6, 9). ($\frac{1}{2}$ times 6 plus 6 should equal 9)

7) (5, 19) and (7, 23)

8) (40, 190) and (50, 240)

9) (1, 7) and (2, 4)

10) (-9, 5) and (6, 10)