Name: _____ Date: _____ Period: _____

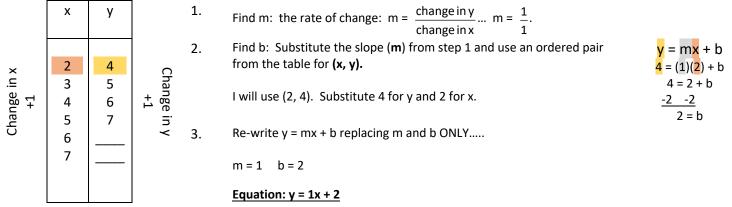## Determining the Function Rule (The equation in y = mx + b format)

Based on the information provided, you need to determine the m (slope) and the b (y-intercept), then replace them in the equation y = mx + b.

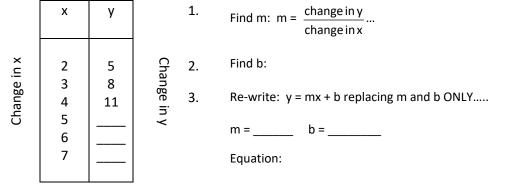**It is helpful to write the 3 steps on your paper before starting your work:**

Step 1: Find m	Step 2: Find b	Step 3: Re-write
Find the slope (m) by any method we have learned in class: rate of change $\dfrac{\text{change in y values}}{\text{change in x values}}$ $\dfrac{y_2 - y_1}{x_2 - x_1}$ $\dfrac{\text{Rise}}{\text{Run}}$ ** Make sure fractions are reduced	Find the y-intercept (b) by: Substitute ANY (x, y) pair and the slope into y = mx + b and solve the equation for b. …. OR… Looking for the value of y when x = 0 (remember any point <u>ON</u> the y-axis has an x-value of 0). If x ≠ 0 in the table, work backwards to find what y equals when x = 0	Once you have m = b = Replace m and b in the equation

Finding the **Function Rule** for any set of data allows you to find the value of the function at **ANY** point. In these examples, it may be easy to just repeat the pattern to complete your y column, however, what if you were asked to find the value of the function at x = 100? You would **not** want to continue the pattern through ALL 100 #s until you find y. By substituting 100 for x into the function rule, you can determine the value of y quite easily. This is true for any x and y value once you have the function rule.

Example 1: Find the function rule for the following table, then complete the table.

Change in x +1

x	y
2	4
3	5
4	6
5	7
6	___
7	___

Change in y +1

1. Find m: the rate of change: m = $\dfrac{\text{change in y}}{\text{change in x}}$ … m = $\dfrac{1}{1}$.

2. Find b: Substitute the slope (**m**) from step 1 and use an ordered pair from the table for **(x, y).**

    I will use (2, 4). Substitute 4 for y and 2 for x.

3. Re-write y = mx + b replacing m and b ONLY…..

    m = 1   b = 2

    Equation: y = 1x + 2

y = mx + b
4 = (1)(2) + b
4 = 2 + b
-2   -2
2 = b

Example 2: Find the function rule for the following table, then complete the table.

Change in x

x	y
2	5
3	8
4	11
5	___
6	___
7	___

Change in y

1. Find m: m = $\dfrac{\text{change in y}}{\text{change in x}}$ …

2. Find b:

3. Re-write: y = mx + b replacing m and b ONLY…..

    m = _____   b = _____

    Equation:

1: Find the function rule for the following table, then complete the table.

x	y
6	4
7	5
8	6
9	
10	
11	

Step 1: Find m

Step 2: Find b

Step 3: Re-write

2: Find the function rule for the following table, then complete the table.

x	y
3	12
4	16
5	20
6	
7	
8	

Step 1: Find m

Step 2: Find b

Step 3: Re-write

3: Find the function rule for the following table, then complete the table.

x	y
2	17
3	18
4	19
5	
6	
7	

Step 1: Find m

Step 2: Find b

Step 3: Re-write

4: Find the function rule for the following table, then complete the table.

x	y
10	20
11	22
12	24
13	
14	
15	

Step 1: Find m

Step 2: Find b

Step 3: Re-write

5: Find the function rule for the following table, then complete the table.

x	y
1	5
3	7
5	9
7	
9	
11	

Step 1: Find m

Step 2: Find b

Step 3: Re-write

6: Find the function rule for the following table, then complete the table.

x	y
2	6
4	12
6	18
8	
10	
12	

Step 1: Find m

Step 2: Find b

Step 3: Re-write