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| * 4.1.4-y=mx+b-What's the rule? How can I use it?
* In Lessons 4.1.2 and 4.1.3, you investigated connections between tile patterns, *x* → *y* tables, graphs, and rules (equations). Today you will use your observations about growth and Figure 0 to write rules for linear patterns and to create new tile patterns for given rules.
* **4-30.** With your team, list some of the equations you have been working with in the past two lessons. What do all of these rules have in common?
* **4-31.** UNDERSTANDING *y* = *mx* + *b*
* Rules for linear patterns can all be written in the form *y* = *mx* + *b*.
* In *y* = *mx* + *b* , *x* and *y* represent variables, while *m* and *b* represent **parameters**. Parameters are numbers that stay the same in the equation after they are chosen. Discuss these questions with your team:
	1. What does *m* tell you about the pattern?
	2. What does *b* tell you about the pattern?

**4-32.** GRAPH → RULE Allysha claims she can find the equation of a line by its graph without using a table. How is that possible? Discuss this idea with your team and then try to find the equation of the line at right without first making a table. Be ready to share with the class how you found the rule. **4-33.** TABLE → RULEAllysha wonders if she can use the idea of *m* and *b* to find the equation of a line from its table. * 1. http://textbooks.cpm.org/images/cc3/chap04/CC3_4-33a.pnggraphFor example, if she knows the information about a linear pattern given in the table below, how can she find the equation of the line? Work with your team to complete the table and find the rule.
	2. Use this same idea to find the rule of the linear tile patterns represented by the tables below.
		1. http://textbooks.cpm.org/images/cc3/chap04/CC3_4-33bi.png
		2. http://textbooks.cpm.org/images/cc3/chap04/CC3_4-33bii.png
	3. Write a summary statement explaining how you used your knowledge about *m* and *b* to quickly write a rule.

**4-34.** RULE → PATTERNIn each problem below, invent your own pattern that meets the stated conditions. * 1. Draw Figures 0, 1, 2, and 3 for a tile pattern that has *y* = 4*x* + 3 as a rule.
	2. A tile pattern decreases by 2 tiles. Figure 2 of the pattern has 8 tiles. Draw Figures 0, 1, 2, and 3 and write the rule (equation) for the pattern.

**4-35.** Invent two different tile patterns that grow by 4 every time but have different*x* → *y* tables. Draw Figures 0, 1, 2, and 3 and find rules for each of your patterns. What is different about your rules? What is the same?  |