## Lesson 12: Changing the Equation

* Let's look at quadratics with negative inputs.

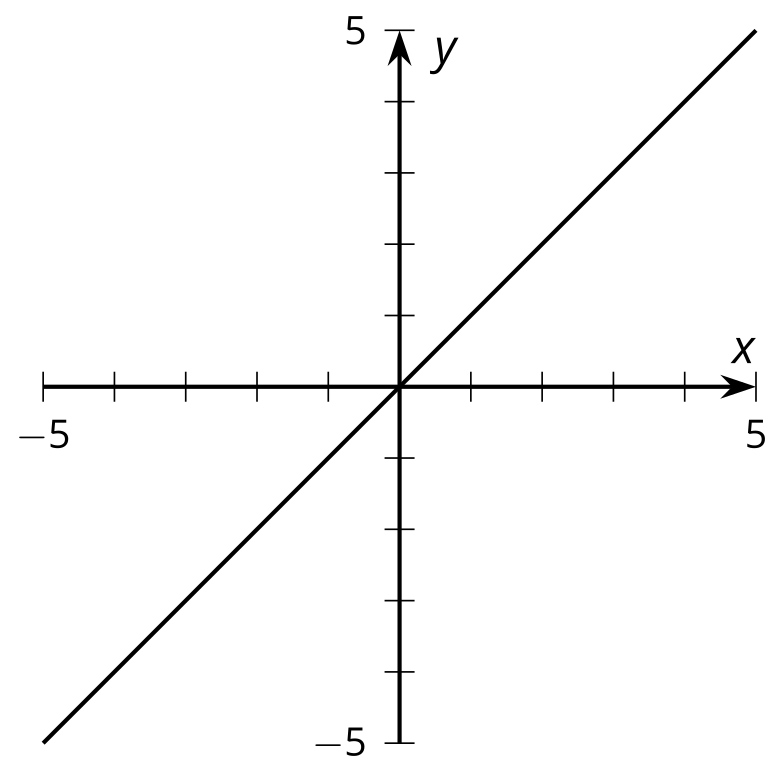
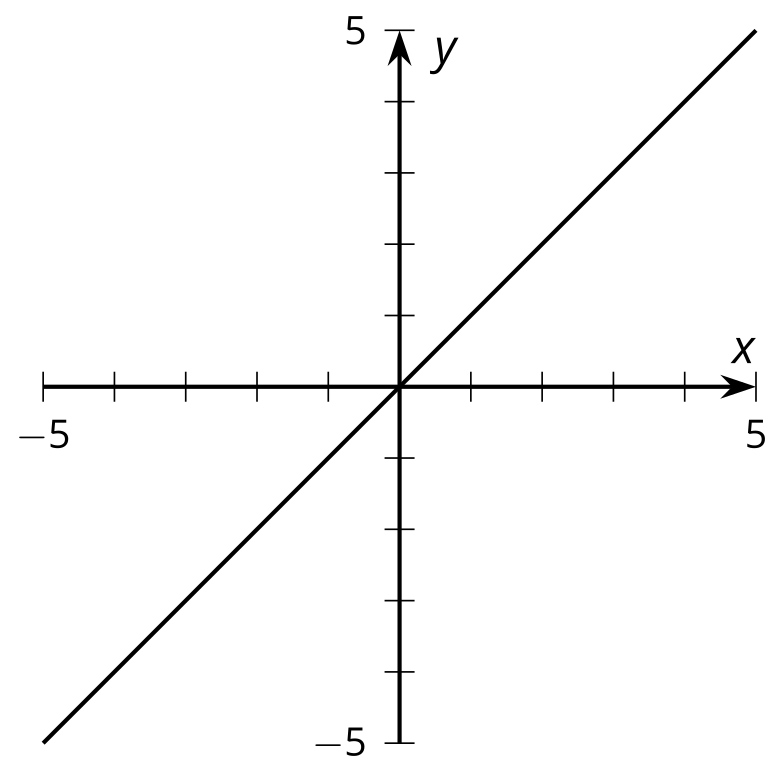
### 12.1: Math Talk: A Negative Input

Evaluate each expression when is -5:

### 12.2: Equations and Their Graphs

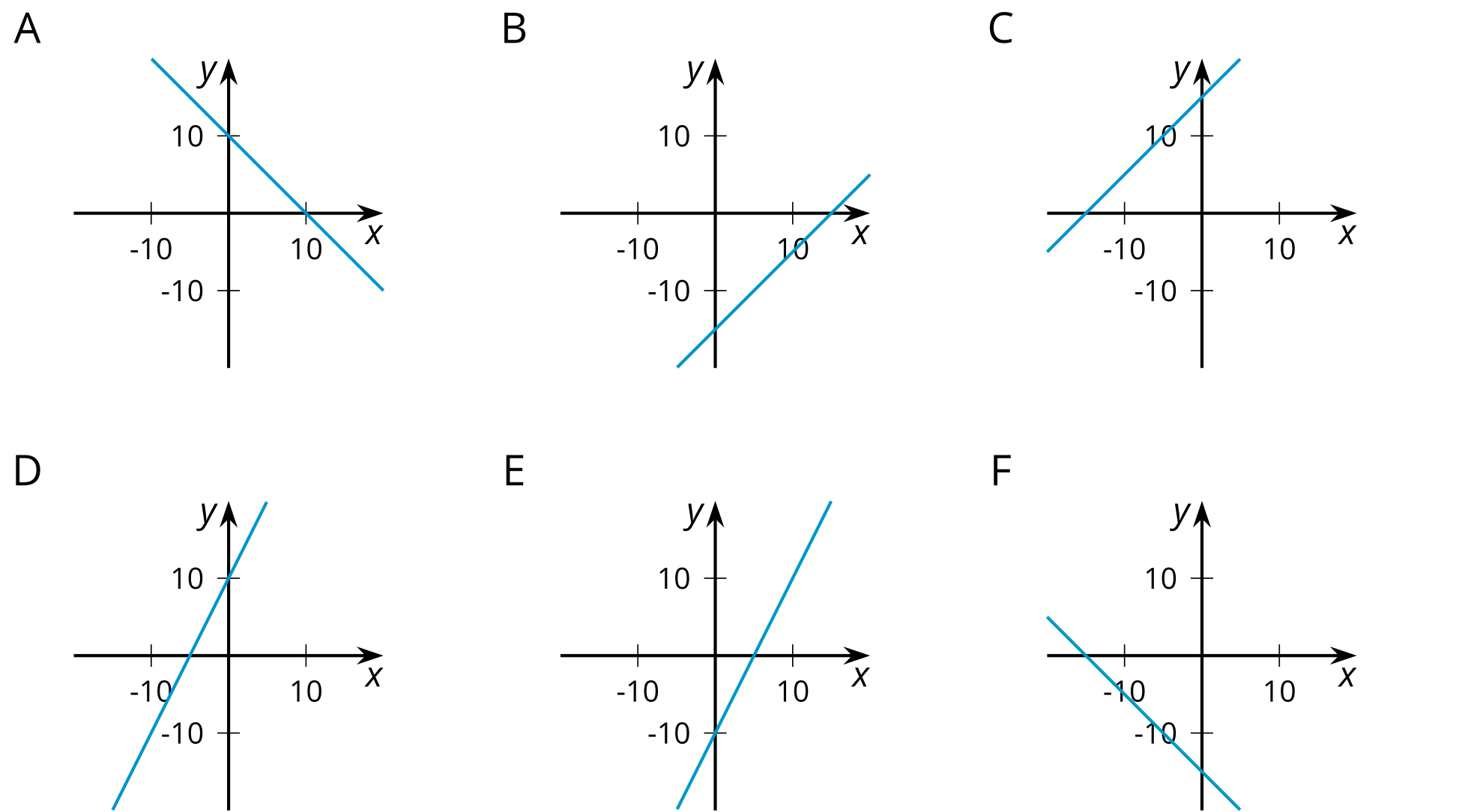
1. Two students are evaluating when is -3. Here is their work. Do you agree with either of them? Explain your reasoning.

* Tyler:
* -2
* Lin:
* 16

1. Evaluate each expression when is -4:
2. Using graphing technology, graph . Then, experiment with the following changes to the function. Record your observations (include sketches, if helpful).
   1. Adding different constant terms to (for example: , ).
   2. Multiplying by different positive coefficients greater than 1 (for example: ).
   3. Multiplying by different positive coefficients between 0 and 1 (for example: ).
   4. Multiplying by negative coefficients (for example: ).
3. Use your observations to sketch these functions on the coordinate plane, which currently shows .
   * 
   * 

### 12.3: Match the Graphs

1. Evaluate each expression when is -3.
2. For each graph, come up with an equation that the graph could represent. Verify your equation using graphing technology.

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