Unit 6 Lesson 12: Changing the Equation

1 Math Talk: A Negative Input (Warm up)

Student Task Statement

Evaluate each expression when x is -5:

$-2x$

x^2

$-2x^2$

$-x^2$

2 Equations and Their Graphs

Student Task Statement

1. Two students are evaluating $x^2 + 7$ when x is -3. Here is their work. Do you agree with either of them? Explain your reasoning.

Tyler:	Lin:
$x^2 + 7$	$x^2 + 7$
$-3^2 + 7$	$(-3)^2 + 7$
$-9 + 7$	$9 + 7$
-2	16

2. Evaluate each expression when x is -4:

   a. x^2

   b. $\frac{1}{2}x^2$

   c. $-\frac{1}{8}x^2$

   d. $-x^2 - 8$

3. Using graphing technology, graph $y = x$. Then, experiment with the following changes to the function. Record your observations (include sketches, if helpful).

   a. Adding different constant terms to x (for example: $x + 4$, $x - 3$).

   b. Multiplying x by different positive coefficients greater than 1 (for example: $6x, 2.5x$).

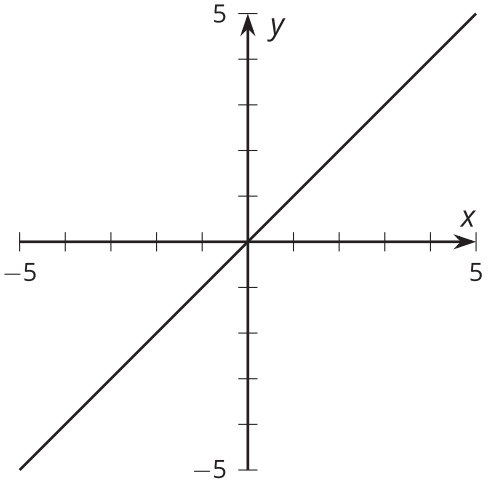
   c. Multiplying x by different positive coefficients between 0 and 1 (for example: $0.25x, 0.1x$).

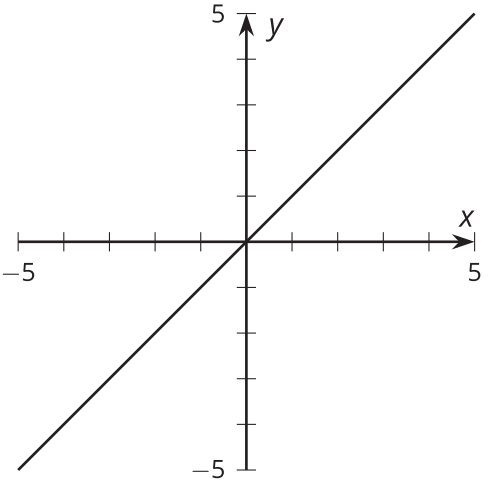
   d. Multiplying x by negative coefficients (for example: $-9x$, $-4x$).

4. Use your observations to sketch these functions on the coordinate plane, which currently shows $y = x$.

   a. $y = -0.5x + 2.1$

   b. $y = 2.1x - 0.5$





3 Match the Graphs

Student Task Statement

1. Evaluate each expression when x is -3.
   a. x^2

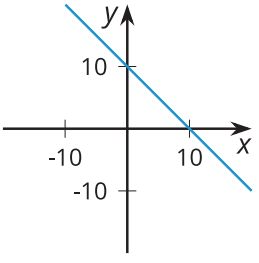
   b. $-x^2$

   c. $x^2 + 20$

   d. $-x^2 + 20$

2. For each graph, come up with an equation that the graph could represent. Verify your equation using graphing technology.

A



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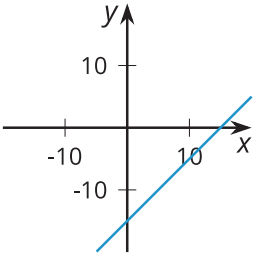

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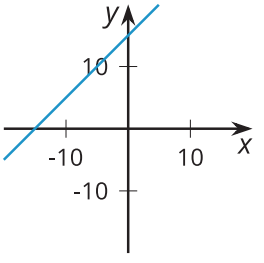

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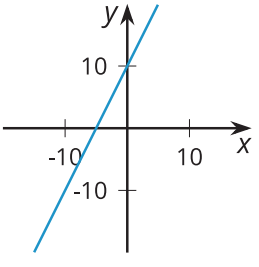

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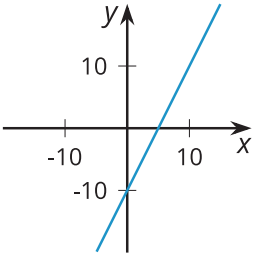
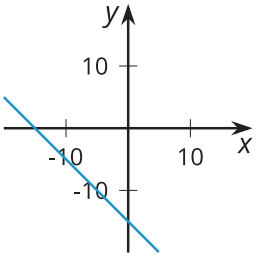
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