Unit 7, Lesson 12

Changing the Equation

Let's look at quadratics with negative inputs.

12.1 Worked Example: Evaluate the Expression

Evaluate $x^2 + 7$ when x is -3.

Step 1:

$$(-3)^2 + 7$$

Step 2:

$$9 + 7$$

Step 3:

$$16$$

12.2 Equations and Their Graphs

1. 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: $6x$, $2.5x$).

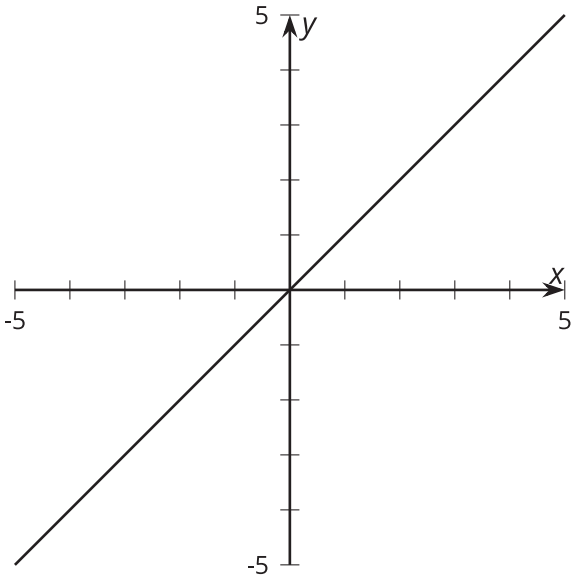
c. Multiplying x by different positive coefficients between 0 and 1 (for example: $0.25x, 0.1x$).

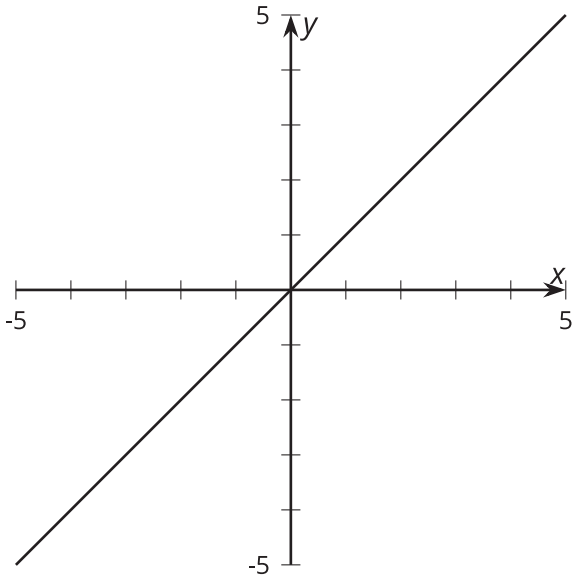
d. Multiplying x by negative coefficients (for example: $-9x$, $-4x$).

2. Use your observations to sketch these functions on the coordinate planes, which currently show $y = x$.

   a. $y = -0.5x + 2.1$

   b. $y = 2.1x - 0.5$





12.3 Match the Graphs

1. Evaluate each expression when x is -3.

   a. x^2

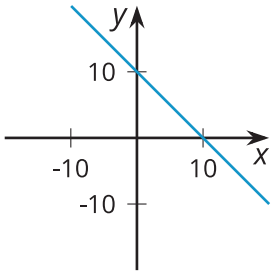
   b. $-x^2$

   c. $x^2 + 20$

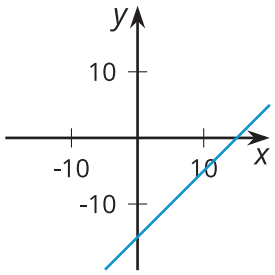
   d. $-x^2 + 20$

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

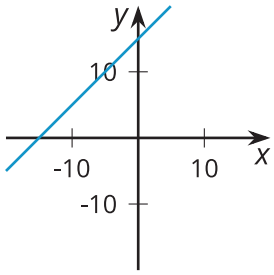
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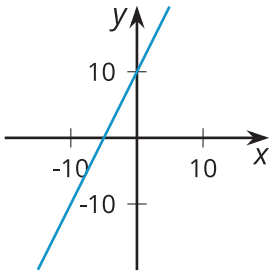
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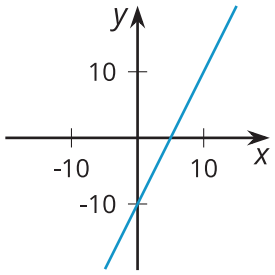
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D



E



F

