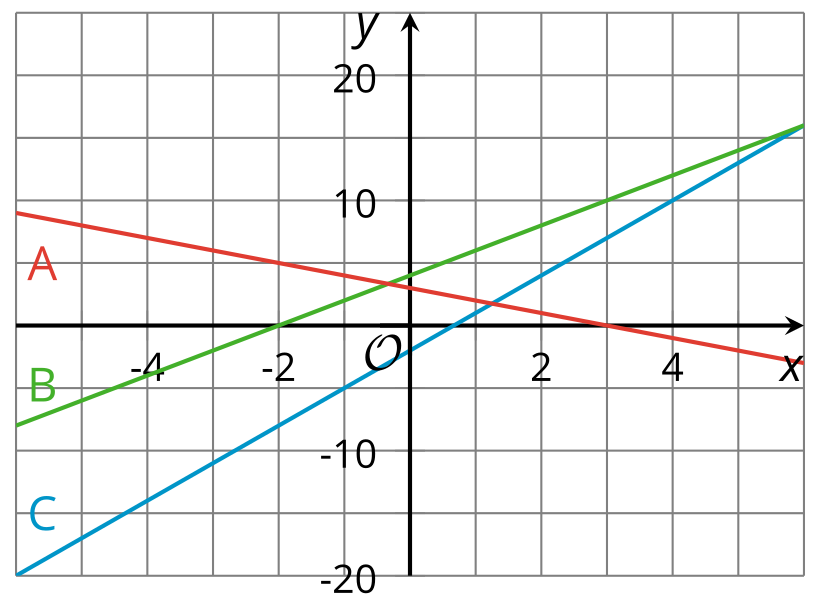
## Unit 6 Lesson 12: Graphing the Standard Form (Part 1)

### 1 Matching Graphs to Linear Equations (Warm up)

#### Student Task Statement

Graphs A, B, and C represent 3 linear equations: , , and . Which graph corresponds to which equation? Explain your reasoning.



### 2 Quadratic Graphs Galore

#### Student Task Statement

Using graphing technology, graph , and then experiment with each of the following changes to the function. Record your observations (include sketches, if helpful).

1. Adding different constant terms to (for example: , , , etc.)

2. Multiplying by different positive coefficients greater than 1 (for example: , , etc.)

3. Multiplying by different negative coefficients less than or equal to -1 (for example: , , etc.)

4. Multiplying by different coefficients between -1 and 1 (for example: , , etc.)

### 3 What Do These Tables Reveal? (Optional)

#### Student Task Statement

* 1. Complete the table with values of and at different values of . (You may also use a spreadsheet tool, if available.)

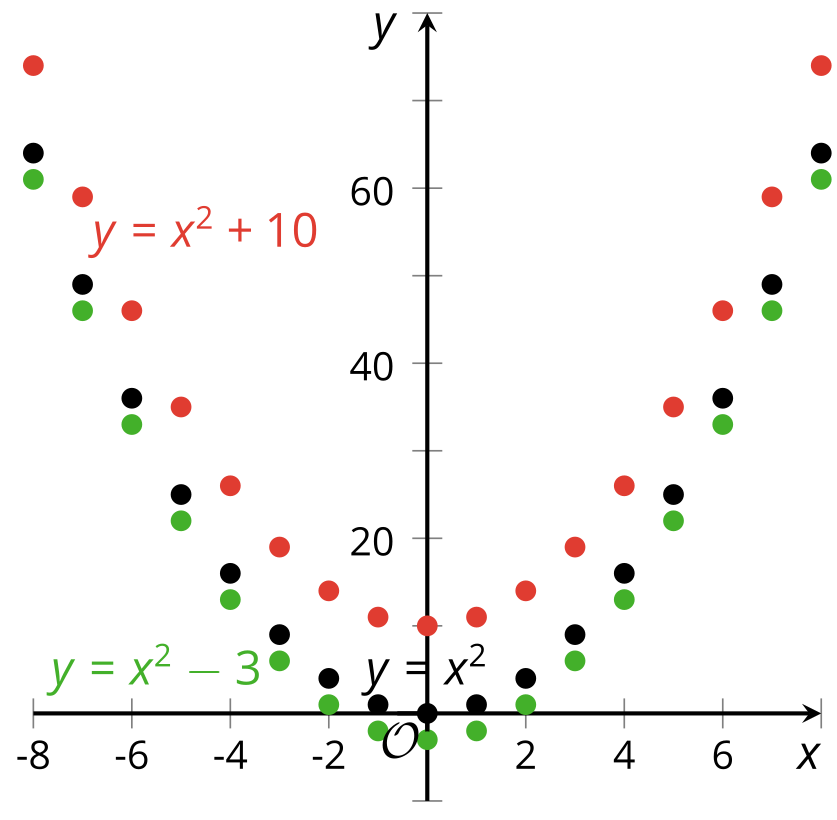
|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | * + -3 | * + -2 | * + -1 | * + 0 | * + 1 | * + 2 | * + 3 |
|  | * + 9 | * + 4 | * + 1 | * + 0 | * + 1 | * + 4 | * + 9 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

* 1. Earlier, you observed the effects on the graph of adding or subtracting a constant term from . Study the values in the table. Use them to explain why the graphs changed they way they did when a constant term is added or subtracted.
  2. Complete the table with values of , , and at different values of . (You may also use a spreadsheet tool, if available.)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | * + -3 | * + -2 | * + -1 | * + 0 | * + 1 | * + 2 | * + 3 |
|  | * + 9 | * + 4 | * + 1 | * + 0 | * + 1 | * + 4 | * + 9 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

* 1. You also observed the effects on the graph of multiplying by different coefficients. Study the values in the table. Use them to explain why the graphs changed they way they did when is multiplied by a number greater than 1, by a negative number less than or equal to -1, and by numbers between -1 and 1.

#### Activity Synthesis



### 4 Card Sort: Representations of Quadratic Functions

#### Student Task Statement

Your teacher will give your group a set of cards. Each card contains a graph or an equation.

* Take turns with your partner to sort the cards into sets so that each set contains two equations and a graph that all represent the same quadratic function.
* For each set of cards that you put together, explain to your partner how you know they belong together.
* For each set that your partner puts together, listen carefully to their explanation. If you disagree, discuss your thinking and work to reach an agreement.
* Once all the cards are sorted and discussed, record the equivalent equations, sketch the corresponding graph, and write a brief note or explanation about why the representations were grouped together.

Standard form:

Factored form:



Explanation:

Standard form:

Factored form:



Explanation:

Standard form:

Factored form:



Explanation:

Standard form:

Factored form:



Explanation:



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