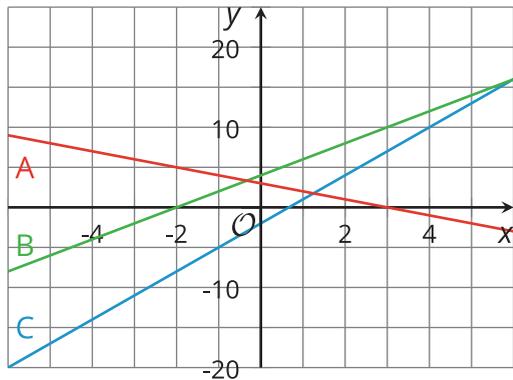


Unit 6 Lesson 12: Graphing the Standard Form (Part 1)

1 Matching Graphs to Linear Equations (Warm up)

Student Task Statement

Graphs A, B, and C represent 3 linear equations: $y = 2x + 4$, $y = 3 - x$, and $y = 3x - 2$. Which graph corresponds to which equation? Explain your reasoning.



2 Quadratic Graphs Galore

Student Task Statement

Using graphing technology, graph $y = x^2$, 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 x^2 (for example: $x^2 + 5$, $x^2 + 10$, $x^2 - 3$, etc.)
2. Multiplying x^2 by different positive coefficients greater than 1 (for example: $3x^2$, $7.5x^2$, etc.)
3. Multiplying x^2 by different negative coefficients less than or equal to -1 (for example: $-x^2$, $-4x^2$, etc.)
4. Multiplying x^2 by different coefficients between -1 and 1 (for example: $\frac{1}{2}x^2$, $-0.25x^2$, etc.)

3 What Do These Tables Reveal? (Optional)

Student Task Statement

1. a. Complete the table with values of $x^2 + 10$ and $x^2 - 3$ at different values of x . (You may also use a spreadsheet tool, if available.)

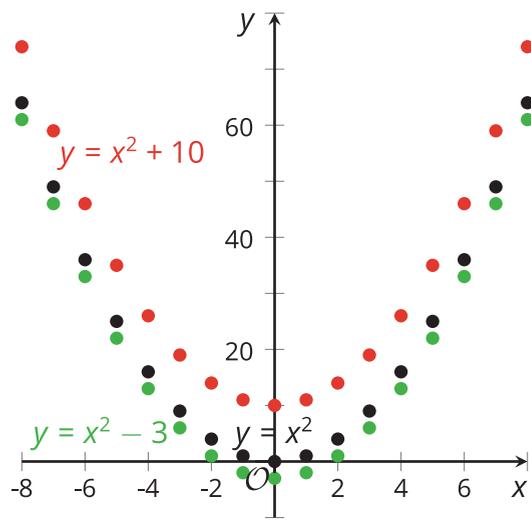
x	-3	-2	-1	0	1	2	3
x^2	9	4	1	0	1	4	9
$x^2 + 10$							
$x^2 - 3$							

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

x	-3	-2	-1	0	1	2	3
x^2	9	4	1	0	1	4	9
$2x^2$							
$\frac{1}{2}x^2$							
$-2x^2$							

- b. You also observed the effects on the graph of multiplying x^2 by different coefficients. Study the values in the table. Use them to explain why the graphs changed the way they did when x^2 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

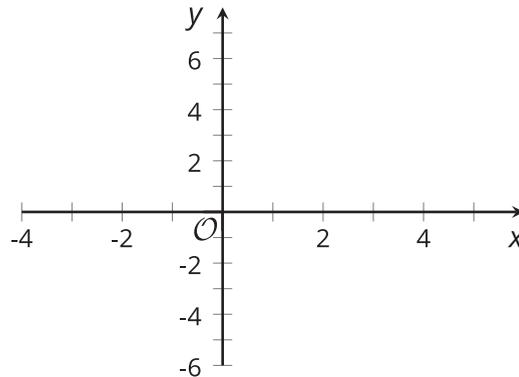
Student Task Statement

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:

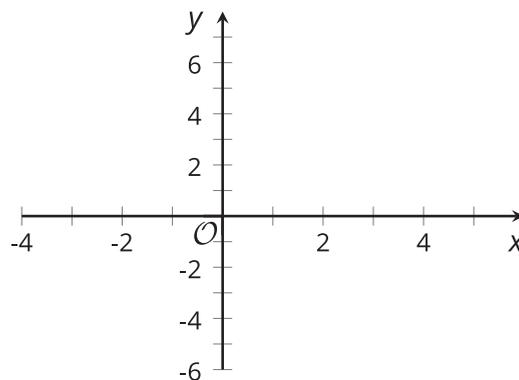
Factored form:



Explanation:

Standard form:

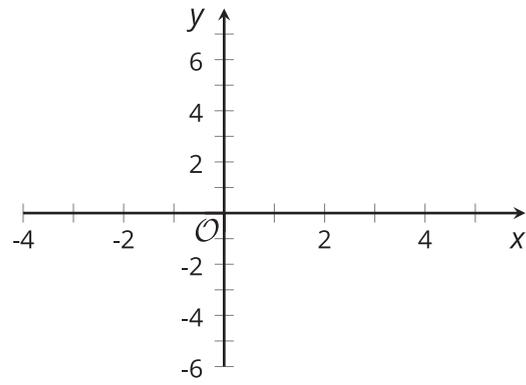
Factored form:



Explanation:

Standard form:

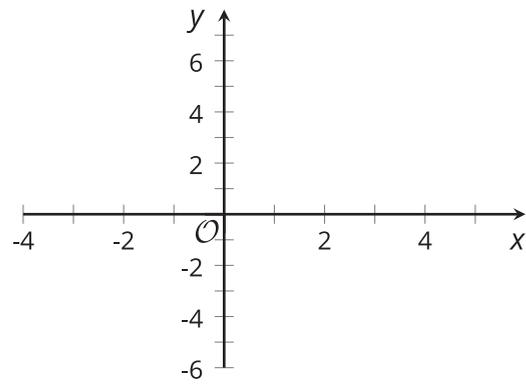
Factored form:



Explanation:

Standard form:

Factored form:



Explanation: