Graphing Quadratic Relations

February 13, 2020

Today's Plan:

Learning Target (standard): I will graph quadratic relations using the vertex method.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

Jan 23-1:40 PM

Graph.

$y = x^2 - 4x + 4$

a) opens up → minimum

b) vertex: (2,0)

$x = -\frac{b}{2a} = \frac{4}{2(1)} = \frac{4}{2} = 2$

$y = 4 - 8 + 4$

$y = 0$

c) AOS: $x = 2$

d) $b^2 - 4ac$

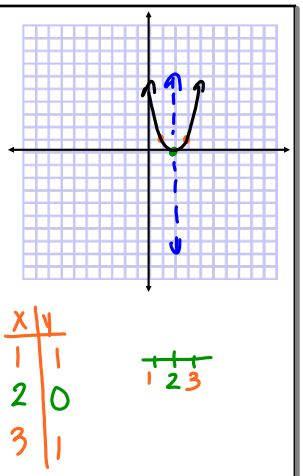
$16 - 4(1)(4)$

$16 - 16$

$0 = 0$ 1 I_x

e)

x	y
1	1
2	0
3	1



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Graph:

$y = -\frac{1}{2}x^2 + 4$

① opens down → maximum

② vertex: (0,4)

$x = -\frac{b}{2a} = \frac{0}{-2(\frac{1}{2})} = 0$

$y = -\frac{1}{2}(0)^2 + 4$

$y = 4$

③ AOS: $x = 0$

④ $b^2 - 4ac$

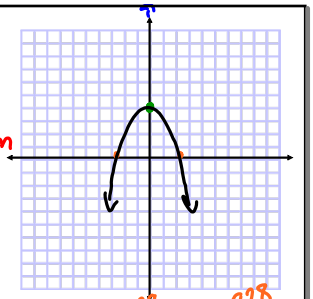
$0 - 4(-\frac{1}{2})(4)$

$8 > 0$ 2 I_x

③ I_x: $(-2\sqrt{2}, 0)$ $(2\sqrt{2}, 0)$ ≈ -2.828 ≈ 2.828

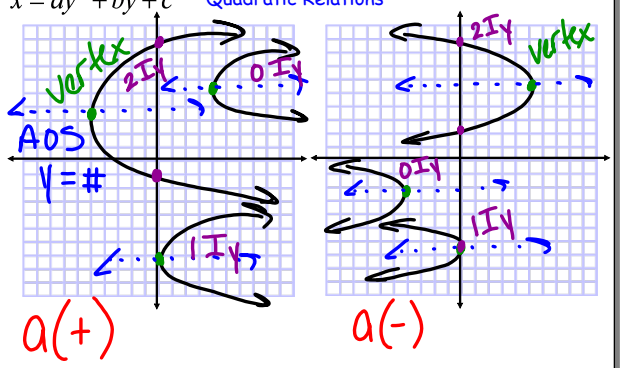
$x = \frac{0 \pm \sqrt{8}}{2(-\frac{1}{2})} = \frac{\pm 2\sqrt{2}}{-1}$

$x = 2\sqrt{2}, -2\sqrt{2}$



Jan 15-2:06 PM

$x = ay^2 + by + c$ "Quadratic Relations"



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Graphing Quadratic Equations:

$x = ay^2 + by + c$

a) opens left or right

b) vertex: $y = -\frac{b}{2a}$ (x, y) * plug in y to get x

c) AOS: $y = -\frac{b}{2a}$

d) $b^2 - 4ac$ < 0 0 I_y $= 0$ 1 I_y > 0 2 I_y

e) I_y or *t*-chart

- 2 I_y - find them
- 0 or 1 I_y - t-chart

x	y
vertex	pick y-value
right	

Jun 30-12:03 PM

Graph.

$x = y^2 + 6y + 5$

① opens right

② vertex: (-4,-3)

$y = -\frac{b}{2a} = -\frac{6}{2(1)} = -3$

$x = (-3)^2 + 6(-3) + 5$

$= 9 - 18 + 5$

$x = -4$

③ AOS: $y = -3$

④ $b^2 - 4ac$

$36 - 4(1)(5)$

$36 - 20$

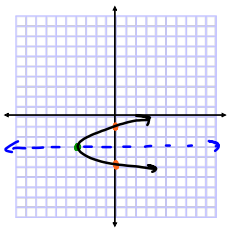
$16 > 0$ 2 I_y

⑤ I_y: (0,-1), (0,-5)

$y = \frac{-6 \pm \sqrt{16}}{2(1)}$

$= \frac{-6 \pm 4}{2}$

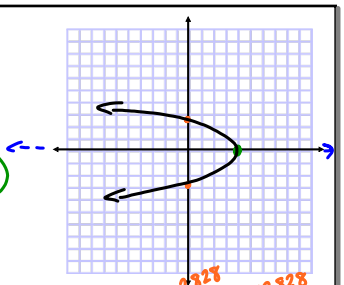
$y = -1, -5$



Jan 15-2:06 PM

Graph:

$x = -\frac{1}{2}y^2 + 4$



① opens left

② vertex: (4, 0)

$y = -\frac{b}{2a} = \frac{0}{2(\frac{1}{2})} = 0$

$x = -\frac{1}{2}(0)^2 + 4$

$x = 4$

③ AOS: $y = 0$

④ $b^2 - 4ac$

$0 - 4(-\frac{1}{2})(4)$

$8 > 0$ $2I_y$

⑤ I_y: $(0, \approx -2.828)$, $(0, \approx 2.828)$

$y = \frac{0 \pm \sqrt{8}}{2(-\frac{1}{2})} = \frac{\pm 2\sqrt{2}}{-1}$

$y = 2\sqrt{2}, -2\sqrt{2}$

Jan 15-2:06 PM

Graph using the vertex method: ③

*use graph paper!

1) $x = -2y^2 + 4y - 3$

2) $x = -y^2 + y + 6$

3) $x = -2y^2 - 4y + 6$

4) $x = 2y^2 + 10y + 12$

5) $x = y^2 - 5y + 6$

Jan 15-2:07 PM