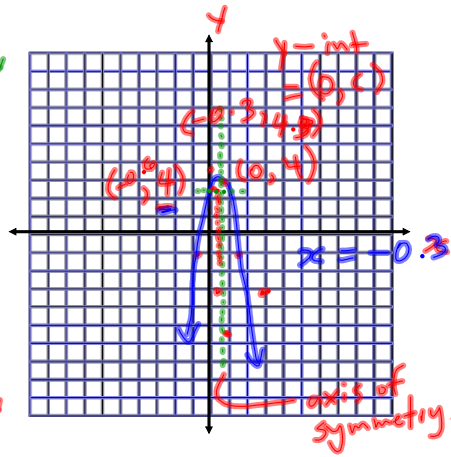


#9 $y = -3x^2 - 2x + 4$
 $y = -3(0)^2 - 2(0) + 4$
 1. Vertex = 4

2. Table of values

3. Plot

$a = -3$ $V\left(\frac{-b}{2a}, \frac{-\Delta}{4a}\right)$
 $b = -2$
 $c = 4$ $\Delta = b^2 - 4ac$
 $\Delta = (-2)^2 - 4(-3)4$
 $\Delta = 4 + 12(4)$
 $\Delta = 52 > 0$ 2 x-int



$V\left(\frac{-(-2)}{2(-3)}, \frac{-52}{4(-3)}\right)$

$x_1 = \frac{-b \pm \sqrt{\Delta}}{2a}$

$V(-0.3, 4.3)$

$x_1 = \frac{-(-2) \pm \sqrt{52}}{2(-3)}$

$x_1 = \frac{2 + 7.21}{-6}$

$x_{11} = \frac{2 - 7.21}{-6}$

$x_1 = -1.5$

$x_{11} = 0.87$

$(-1.5, 0)$

$(0.87, 0)$

To find image point of y-int (0,4) use formula.

$0 = ax^2 + bx + c$

$y = -3x^2 - 2x + 4$
 we know $y = 4$

$4 = -3x^2 - 2x + 4$ (solve x)

$0 = -3x^2 - 2x + 4 - 4$

$0 = -3x^2 - 2x$

$x_1 = \frac{-b + \sqrt{\Delta}}{2a}$

$a = -3$

$\Delta = b^2 - 4ac$

$b = -2$

$\Delta = (-2)^2 - 4(-3)(0)$

$x_1 = \frac{-(-2) + 2}{2(-3)}$

$c = 0$

$\Delta = 4$

$x_1 = \frac{4}{-6}$

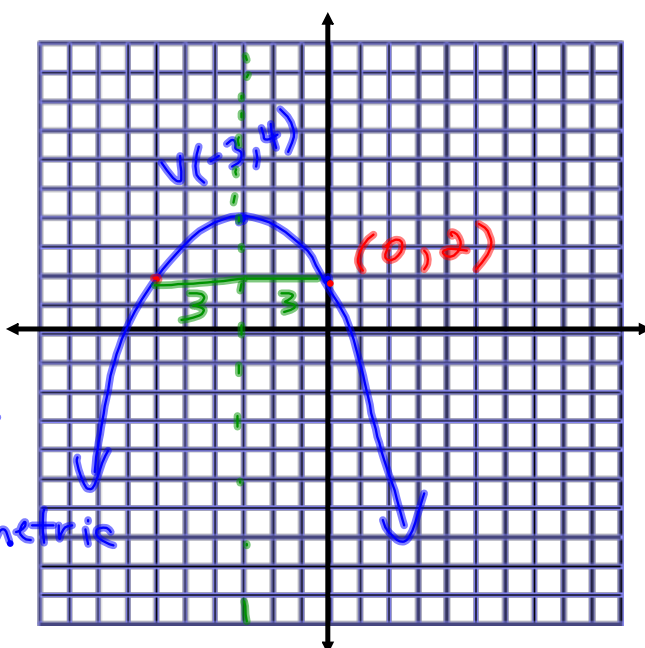
$x_{11} = \frac{-(-2) - 2}{2(-3)}$

$x_1 = -0.6$

$y = 4 \Rightarrow$

$= 0$

$(-6, 2)$
image point
of y -int
or
point symmetric
w/ y -int



13. unknowns \rightarrow keyword
Original/Normal New/Different

x = time	h	$x + 7.5 \text{ mins}$
y = flow rate	$\frac{L}{h}$	$x + 0.125 \frac{\text{min}}{\text{hr}}$
Capacity	260 L	Capacity 260

① $x \cdot y = 260$ ② $(x + 0.125)(y - 100) = 260$

$x = \frac{260}{y}$ $x + 0.125 = \frac{260}{y - 100}$

Sub $x = \frac{260}{y}$ into ② $\rightarrow \left(\frac{260}{y} + \frac{0.125}{1 \times y} \right) = \frac{260}{y - 100}$

$\frac{260 + 0.125y}{y} = \frac{260}{y - 100}$ cross multiply

$260y = (y - 100)(260 + 0.125y)$

$260y = 260y + 0.125y^2 - 26000 - 12.5y$

$0 = -260y + 260y + 0.125y^2 - 26000 - 12.5y$

$a = 0.125$ $\Delta = b^2 - 4ac$
 $b = -12.5$ $\Delta = (-12.5)^2 - 4(0.125)(-26000)$
 $c = -26000$ $\Delta = 13156.25 > 0$ 2 solutions

$y_1 = \frac{-(-12.5) + \sqrt{13156.25}}{2(0.125)}$ $y_2 = \frac{-(-12.5) - \sqrt{13156.25}}{2(0.125)}$

$y_1 = 508.8 \frac{L}{h}$ ~~$y_2 = -408.8$~~

\therefore the original flow rate is $508.8 \frac{L}{h}$.

a) F $\Delta = 0$ e, f

b) F

c) F $\Delta = 0$

d) F $\Delta < 0$
 $\Delta > 0$ 2 solut



- $\Delta > 0$ 2 solutions
- $\Delta = 0$ 1 solution
- $\Delta < 0$ 0 solutions