

Graphing a Quadratic Inequality

- Determine if the parabola should be solid or dashed.
 - Solid if \leq or \geq $\leftarrow - - \rightarrow$
 - Dashed if $<$ or $>$ $\leftarrow \text{---} \rightarrow$
- Graph the parabola (5 points in total): you can use your graphing calculator table
 - Vertex (h, k) or $(-\frac{b}{2a}, f(-\frac{b}{2a}))$
 - Zeros/roots/solutions/x-intercepts
 - Y-intercept & symmetric point $(0, c)$
- Determine if the parabola should be shaded above or below (test point = $(0,0)$ unless the quadratic goes through $(0,0)$)
 - True statement = shade where your test point is located \checkmark
 - False statement = shade opposite of where your test point is located \times

TASK 1: Graph the quadratic inequality

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

$> \leftarrow - - \rightarrow$
 $>$ above $\leftarrow \text{---} \rightarrow$

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

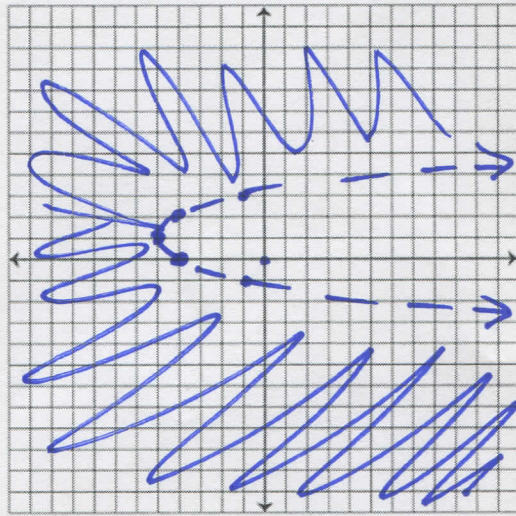
$y > -0^2 + 2(1) + 4$

$y > -1 + 2 + 4$

$y > 5$

$V: (1, 5)$

-1	4	5	4	1
0	1	2	3	1



TASK 2: Graph the quadratic inequality

$y \geq x^2 + 2x - 8$

$\geq \leftarrow \text{---} \rightarrow$
 \geq above $\leftarrow \text{---} \rightarrow$

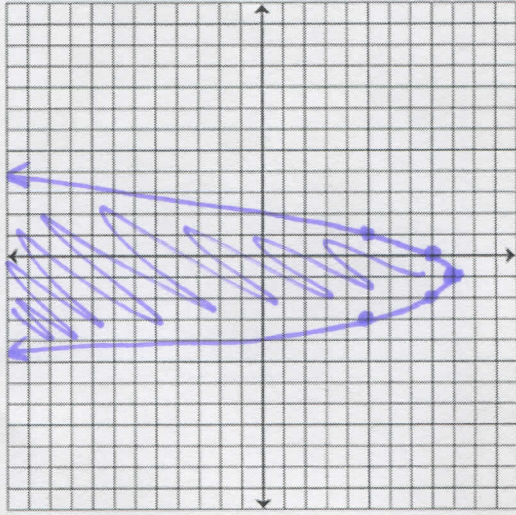
$-\frac{b}{2a} = \frac{-2}{2(1)} = -1$

$y = (-1)^2 + 2(-1) - 8$

$= 1 - 2 - 8$

$= -9 \quad (-1, -9)$

-3	-5	-8	-9	-8
-2	-1	0	1	-8



TP: $0 > -(0)^2 + 2(0) + 4$
 $0 > 4 \quad \times$

TASK 3: Graph a system of quadratic inequalities

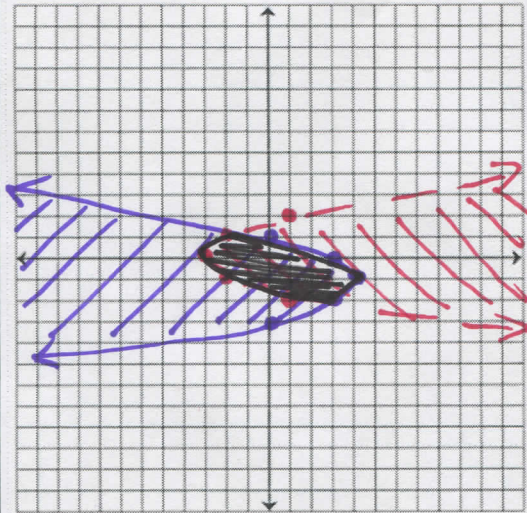
The overlap of the shading creates all possible solutions to the system.

$y < -x^2 + 3$
 $y \geq x^2 + 2x - 3$

$y_1 < \leftarrow \text{below}$

$y_2 \geq \rightarrow \text{above}$

-3	0
-2	-3
-1	-4
0	-3
1	0



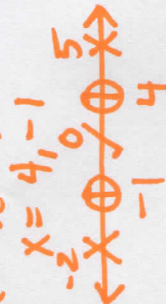
Solving a Quadratic Inequality in ONE Variable

- Solve the inequality as if it is an equation with an =.
 - Quadratic formula
 - Completing the square
 - Square root formula
 - Factoring
 - Graphing
- Graph your two solutions on a number line and pick your three test points.
 - Left of the smallest solution
 - Between your two solutions
 - Right of the largest solution
- Write your solution based on step two in interval notation
 - If left and right of your solutions then it is an OR answer
 - If between your solution then it is an AND answer

TASK 4: Solve the quadratic inequality

$x^2 - 3x - 4 < 0$

$(x-4)(x+1) < 0$



$-2: (-2)^2 - 3(-2) - 4 < 0$

$4 + 6 - 4 < 0$

$6 < 0$ X

$0: (0)^2 - 3(0) - 4 < 0$

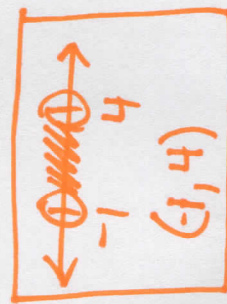
$0 + 0 - 4 < 0$

$-4 < 0$ ✓

$5: (5)^2 - 3(5) - 4 < 0$

$25 - 15 - 4 < 0$

$6 < 0$ X



Still need help with: