

Solve Quadratic
Inequalities
By
Graphing/ Tables

GLUE
HERE

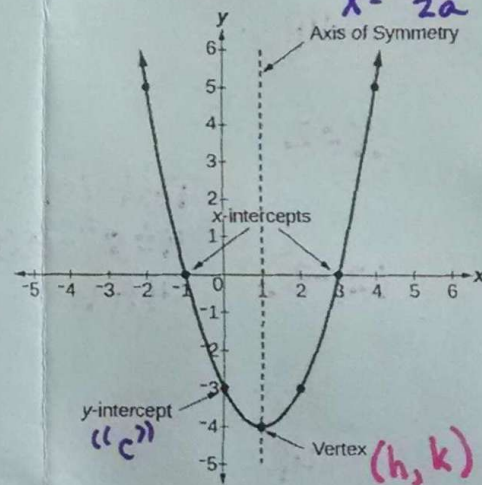
Solve Quadratic
Inequalities
By
Factoring ☺

$< >$ → dashed \circ
()

$\leq \geq$ → Solid \bullet
[]

Graphing
Quadratic
Inequalities

$$x = h$$
$$x = \frac{-b}{2a}$$



Standard form

$$y = ax^2 + bx + c$$

Vertex Form

$$y = a(x-h)^2 + k$$

a) $y < -2x^2 - 4x + 6$ (Standard)

y-intercept: $(0, 6)$

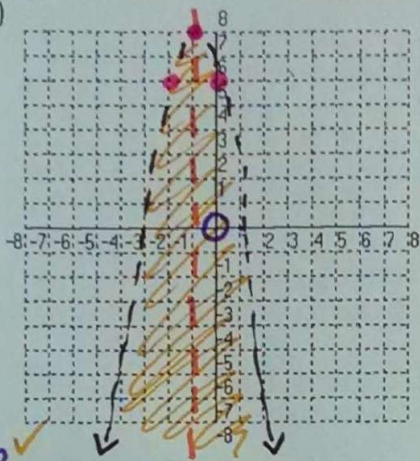
opens down

Axis of Symmetry: $x = -\frac{b}{2a}$

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

Vertex:
 $x = -1$
 $-2(-1)^2 - 4(-1) + 6$

Test $(0, 0)$ $(-1, 8)$
 $0 < -2(0)^2 - 4(0) + 6$ $0 < 6$ ✓



b) $y \leq x^2 - 4x + 1$

y-intercept: $(0, 1)$

opens up

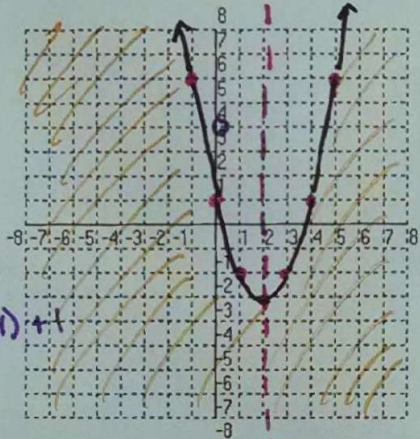
Axis of Symmetry: $x = -\frac{b}{2a}$

$x = 2$

Vertex:

$(2, -3)$

Test $(0, 4)$
 $4 \leq 0^2 - (0)(4) + 1$
 $4 \leq 1$



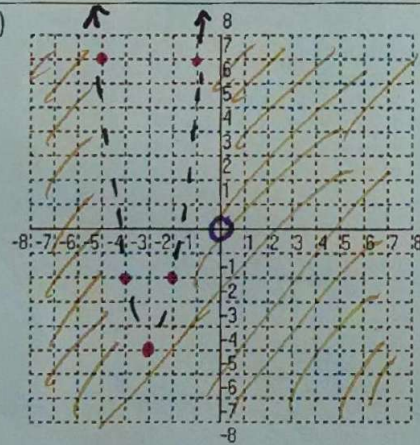
c) $y < 3(x + 3)^2 - 5$ (Vertex Form)

opens up

Vertex $(-3, -5)$

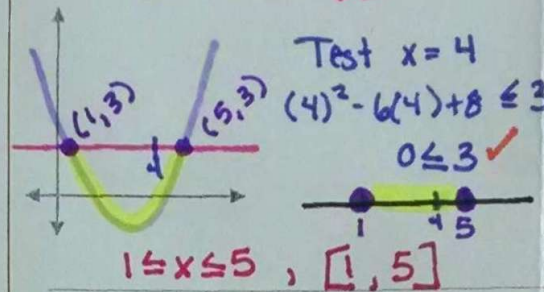
Test $(0, 0)$

$0 < 3(0+3)^2 - 5$
 $0 < 3(3)^2 - 5$
 $0 < 22$ ✓

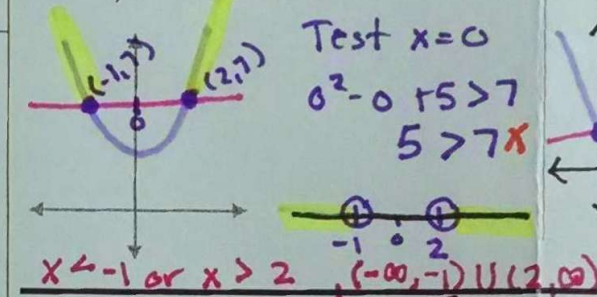


Solve

d) $x^2 - 6x + 8 \leq 3$



e) $x^2 - x + 5 > 7$



g) $x^2 - 4x + 1 > 6$

$x^2 - 4x - 5 > 0$

$(x^2 + 1x - 5x - 5)$

$x(x+1) - 5(x+1)$

$(x+1)(x-5)$

$x = -1$ $x = 5$

$x < -1$ or $x > 5$, $(-\infty, -1) \cup (5, \infty)$

h) $x^2 \leq 16$

$x^2 - 16 \leq 0$

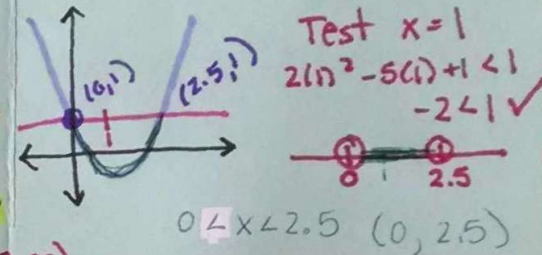
$(x-4)(x+4)$

$x = 4$ $x = -4$

$-4 \leq x \leq 4$ $[-4, 4]$

- 1) Enter right side into y_1
- 2) Enter left side into y_2
- 3) Graph or look at table for solutions
- 4) plug x - values into quadratic function to determine shading
- 5) Write solution as inequality or interval notation

f) $2x^2 - 5x + 1 < 1$



- 1) Set equal to 0
- 2) Factor completely
- 3) Solve by setting each factor equal to 0
- 4) Use number line to help you write solution as an inequality

i) $2x^2 - 3x - 5 < 0$

$(2x^2 - 5x + 2x - 5)$

$x(2x-5) + 1(2x-5)$

$(x+1)(2x-5)$

$x = -1$ $x = 5/2$

$-1 < x < 2.5$ $(-1, 2.5)$