

Date:

Chapter: Chapter 5:8 --> Quadratic Inequalities

Objectives: Graph quadratic inequalities in two variables.
Solve quadratic inequalities in one variable.

Notes:

How to Graph a Quadratic Inequality

--Just like graphing a Linear Inequality--

- 1) Graph the inequality
- 2) Pick a test pt. --> preferred: (0, 0)
- 3) Shade the test pt. that is a solution

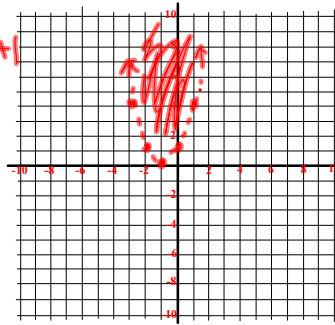
Examples:

Ex. 1 - Graph

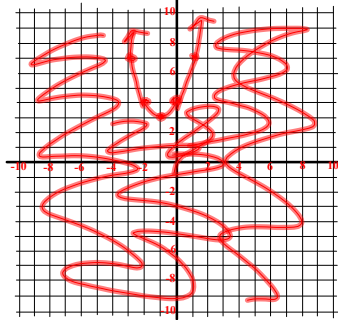
a) $y > x^2 + 2x + 1$

$x = \frac{-b}{2a}$ $0 > 0^2 + 2(0) + 1$
 $x = \frac{-2}{2(1)} \rightarrow -1$ $0 > 1$

x	y
0	1
-1	0
-2	1
-3	4



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

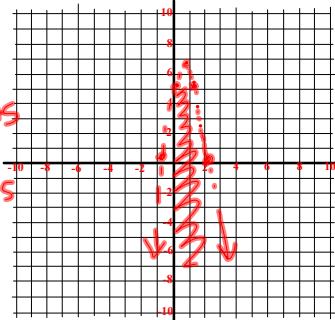


c) $y < -2x^2 + 3x + 5$

$x = \frac{-b}{2(-2)} = \frac{3}{4}$
 $-2(\frac{3}{4})^2 + 3(\frac{3}{4}) + 5$

x	y
2	0
1	5
0.75	6.25
0	5
-1	0

$0 < 5$



Ex. 2 - Solve algebraically

a) $x^2 - 3x \leq 18$

$x^2 - 3x - 18 \leq 0$
 $(x+3)(x-6) = 0$
 $x = -3, 6$



$\{x \mid -3 \leq x \leq 6\}$

b) $x^2 + 5x < -6$

$x^2 + 5x + 6 < 0$
 $(x+3)(x+2) = 0$
 $x = -3, -2$



c) $x^2 + 11x + 30 \geq 0$

$(x+5)(x+6) = 0$
 $x = -5, -6$
 $\{x \mid x \leq -6 \text{ or } x \geq -5\}$



test pt = 0
 $30 > 0 \checkmark$
 $(-5.5)^2 + 11(-5.5) + 30 = -0.25 > 30 \times$
 $(-7)^2 + 11(-7) + 30 = 2 > 0 \checkmark$

Homework:

p. 316 (#14-18 Evens, 34-44 Evens)