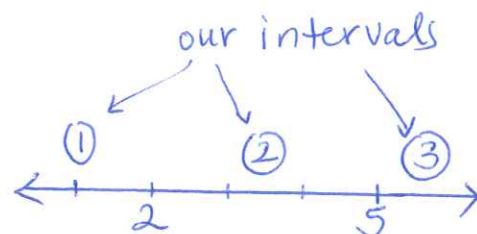


9.2 Quadratic Inequalities in One Variable (Part 2)

Last day we looked at solving quadratic inequalities (in 1 variable) graphically.

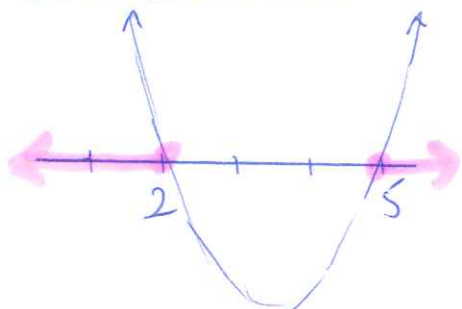
Such inequalities can also be solved using algebraic methods.

Example: Solve $x^2 - 7x + 10 \geq 0$



a) by graphing.

$$(x-2)(x-5) \geq 0$$



$$x \leq 2 \text{ or } x \geq 5$$

b) using sign analysis.

$(x-2)(x-5) \geq 0$ roots: 2 and 5
 We use a sign chart to test points.

Interval	Factors (x-2)	(x-5)	Function (x-2)(x-5)
① $x < 2$	-	-	+
② $2 < x < 5$	+	-	-
③ $x > 5$	+	+	+

$$x \leq 2 \text{ or } x \geq 5$$

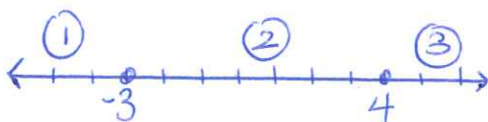
Example: Solve each inequality using sign analysis.

a) $-x^2 + x + 12 < 0$

$$-(x^2 - x - 12) < 0$$

$$-(x-4)(x+3) < 0$$

Roots: -3, 4



Interval	Factors -1 (x-4)	(x+3)	Function -(x-4)(x+3)
① $x < -3$	-	-	-
② $-3 < x < 4$	-	+	+
③ $x > 4$	-	+	-

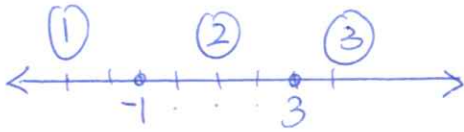
$$x < -3 \text{ or } x > 4$$

Note: Sign analysis is a skill we require in Calculus!!

b) $x^2 - 2x - 3 \leq 0$

$(x-3)(x+1) \leq 0$

Roots: $-1, 3$



Interval	Factors		Function
	$(x-3)$	$(x+1)$	$(x-3)(x+1)$
① $x < -1$	-	-	+
② $-1 < x < 3$	-	+	-
③ $x > 3$	+	+	+

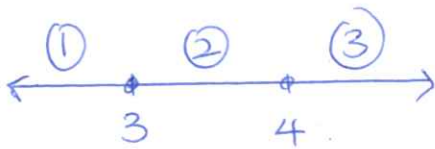
$-1 \leq x \leq 3$

c) $-x^2 + 7x > 12$

$-x^2 + 7x - 12 > 0$

$-(x^2 - 7x + 12) > 0$

$-(x-3)(x-4) > 0$



Interval	Factors			Function
	$-(x-3)(x-4)$			$-(x-3)(x-4)$
① $x < 3$	-	-	-	-
② $3 < x < 4$	-	+	-	+
③ $x > 4$	-	+	+	-

$3 < x < 4$