

9.2: Quadratic Inequalities in one variable.

For this type, we can have

$$ax^2 + bx + c \geq 0$$

$$ax^2 + bx + c < 0$$

etc.

example 1:

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

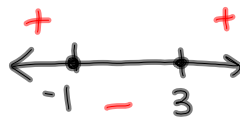
$$x^2 - 2x - 3 = 0$$

$$(x - 3)(x + 1) = 0$$

$$x = 3 \quad x = -1$$

Where the graph (parabola) is below & equal to zero.

Book method:



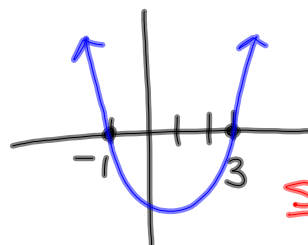
test point
let $x = -2$

$$\begin{aligned} x^2 - 2x - 3 \\ (-2)^2 - 2(-2) - 3 \\ 4 + 4 - 3 \\ = 5 \end{aligned}$$

Method 2

Roots are -1 & 3 from above

$x^2 - 2x - 3 \leftarrow$ opens up



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

Solution
 $-1 \leq x \leq 3$

b) $x^2 - 2x - 3 > 0$

$x < -1$ and $x > 3$

\leftarrow above the x-axis

$$2. \quad -x^2 + x + 12 < 0$$

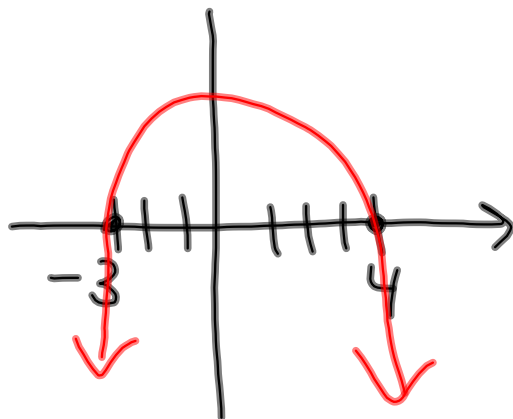
Solve for roots

$$-x^2 + x + 12 = 0$$

$$x^2 - x - 12 = 0$$

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

$$x = 4 \quad x = -3$$



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

$$x < -3 \vee x > 4$$

$$b) \quad -x^2 + x + 12 > 0$$

$$-3 < x < 4$$

page 484

#1, 2, 7