

M\$5 Classwork 2

Solving Quadratic Inequalities

Example: Solve: $x^2 - 6 > -5x$

1. Write the quadratic inequality in standard form.

$$x^2 + 5x - 6 > 0$$

2. Solve the quadratic *equation*, $x^2 + 5x - 6 = 0$, to get the “boundary points.”

$$\begin{aligned}(x+6)(x-1) &= 0 \\ x+6=0 \quad \vee \quad x-1=0 \\ x=-6 \quad \vee \quad x=1\end{aligned}$$

3. Plot the “boundary points,” -6 and 1 , on a number line.

4. Test a point in each interval to see which interval(s) is part of the solution set.

i) $x < -6$	Test $x = -7$:	$x^2 + 5x - 6 > 0$ $(-7)^2 + 5(-7) - 6 > 0$ $49 - 35 - 6 > 0$ $8 > 0$	YES
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ii) $-6 < x < 1$	Test $x = 0$:	$x^2 + 5x - 6 > 0$ $(0)^2 + 5(0) - 6 > 0$ $-6 \not> 0$	NO
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iii) $x > 1$	Test $x = 2$:	$x^2 + 5x - 6 > 0$ $(2)^2 + 5(2) - 6 > 0$ $4 + 10 - 6 > 0$ $8 > 0$	YES
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5. State the solution set and draw the graph.

$$\boxed{\{(x < -6) \vee (x > 1)\}}$$

Exercises: State the solution set and graph the solution set on a number line.

1. $x^2 - 1 > 0$

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

3. $9 + 3x^2 \geq 4x^2$

4. $12x - x^2 > 36$

5. $5x^2 > 6 - 13x$

6. $2x^2 - 11x + 5 \geq 0$

7. $x^2 + 9x \leq 0$

8. $9x^2 - 18 \leq 0$

9. $2x^2 + 4x + 2 < 0$

10. $x^2 + 9 + 3x > 3(x + 3)$