Solving Quadratic and Higher Degree Inequalities

Strategy –

1. **Find the critical points**
2. **Plot those points on a number line to identify intervals**
3. **Check convenient points in those intervals to determine which make the inequality true**

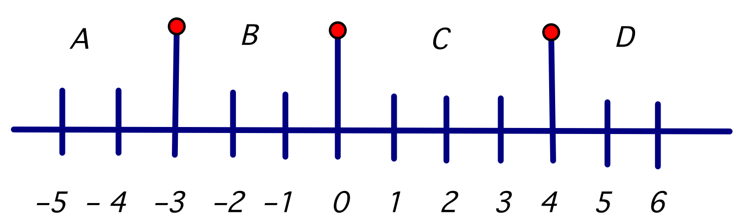
Procedure

1. **Place everything on one side, zero on the other side**
2. **Factor completely**
3. **Find the critical points**
4. **Plot those on a number line to identify intervals**
5. **Check convenient points in those intervals to determine which interval(s) make the inequality true**

Example **Solve the inequality** $x^3 - x^2 \geq 12x$

1. $x^3 - x^2 - 12x \geq 0$
2. $x(x^2 - x - 12) \geq 0$

   $x(x - 4)(x + 3) \geq 0$
3. $x = 0$, $x = 4$ and $x = -3$



5. **Intervals A, B, C and D**

   A Interval A, –5 does not work. Interval B, – 1 works

   Interval C, 2 does not work. Interval D, 10 works.

Therefore the solution is $-x \leq x \leq 0$ **U** $x \geq 4$

Find the solution set for the following inequalities.

	A	B
1.	$(x-3)(x-6) > 0$	$(x+5)(x-2) < 0$
2.	$(x+6)(x+4) > 0$	$(x+6)(x+4) < 0$
3.	$(x-2)(x-5)(x-10) > 0$	$(x-1)(x-5)(x+3) < 0$
4.	$(x+2)(x-3)(x-6) < 0$	$x(x+1)(x-5) > 0$
5.	$(x+2)(x+10)(x-1) < 0$	$x(x-10)(x+3) < 0$
6.	$(2x+1)(x-4)(x+5) > 0$	$(x-2)^2(x+3) > 0$
7.	$(x+1)(x-5)^2 < 0$	$(x-3)^3(x+4) > 0$