



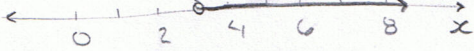
# 2.6 Solve Factorable Polynomial Inequalities Algebraically

Example #1: Solve each inequality. Show each solution on a number line.

a)  $3x - 2 > 7$

$$3x > 9$$

$$x > 3$$



b)  $2x + 1 > 5x - 11$

$$1 > 3x - 11$$

$$12 > 3x$$

$$4 > x$$

$$x < 4$$

$$2x + 1 > 5x - 11$$

$$-3x + 1 > -11$$

$$-3x > -12$$

$$x < 4$$

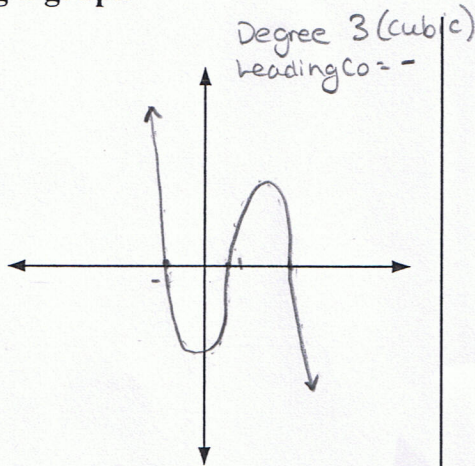
when dividing by negative, change sign



Example #1: Solve:  $(2 - 3x)(x + 1)(3x - 2) < 0$

The roots of  $(2 - 3x)(x + 1)(3x - 2) = 0$  are:  $x = \frac{2}{3}, -1, 2$

Method #1: Using a graph



so  $(2 - 3x)(x + 1)(x - 2) < 0$

if  $x > 2$  or  $-1 < x < \frac{2}{3}$

Method #2: Using Intervals

Interval	$x < -1$	$-1 < x < \frac{2}{3}$	$\frac{2}{3} < x < 2$	$x > 2$
Factor				
$2 - 3x$	+	+	-	-
$x + 1$	-	+	+	+
$x - 2$	-	-	-	+
$(2 - 3x)(x + 1)(x - 2)$	+	-	+	-

so solution is

$$x > 2, -1 < x < \frac{2}{3}$$