Intervals using **inequality notation** look like this:

$1 < x < 4$

$x \geq 4$

$x < 8$

$-2 \leq x \leq 3$

Another way to describe intervals is with **interval notation**
Critical values are written in round ( ) brackets, square [ ] brackets or a combination.

Round represent $<$ OR $>$ (open interval)

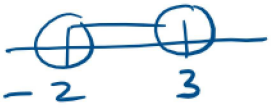
Square " $\leq$ OR $\geq$ (closed interval)

eg. $x > 4$ $(4, \infty)$ $x < 4$ $(-\infty, 4)$

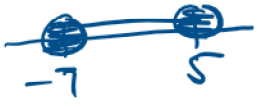
$x \geq 7$

$[7, \infty)$

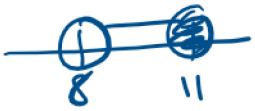
open interval eg. $(-2, 3)$



closed " eg. $[-7, 5]$



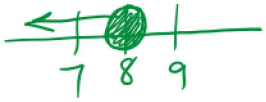
combination eg. $(8, 11]$



Solving using Algebra – isolate variable

ex. 1 $2x - 5 \leq 11$
$+5 \quad +5$

graph

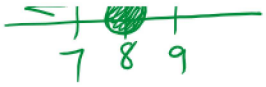


ex. 1 $2x - 5 \leq 11$

$+5 \quad +5$

$\frac{2x}{2} \leq \frac{16}{2}$

$x \leq 8$ ✓ ineq. not.

graph 

interval notation $(-\infty, 8]$

check subst $x = 0$

$2(0) - 5 \leq 11$

$-5 \leq 11$ T

2. $-4x > 2x - 9$

$-2x \quad -2x$

$\frac{-6x}{-6} > \frac{-9}{-6}$

$x < \frac{3}{2}$ ✓

⊛ when $\times$ OR $\div$ BY a NEGATIVE you MUST change the inequality sign

check $x = 0$ $\quad -4(0) > 2(0) - 9$

$0 > -9$ T

interval notation → $(-\infty, \frac{3}{2})$

ex. 3 $3x^2 + 2x - 1 < 0$

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

below OR negative

C.V. $x = \frac{1}{3} \quad x = -1$

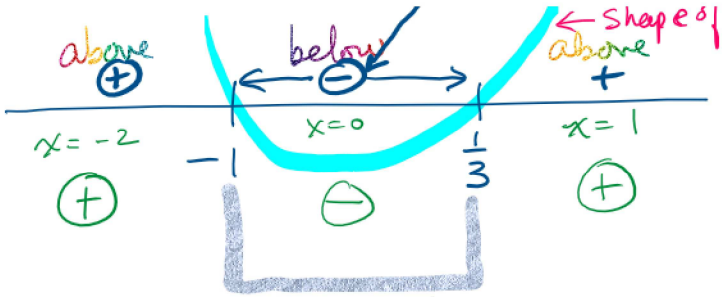
x-int

above ⊕ | below ⊖ | above ⊕ ← shape of graph

⊛ one side "0"

→ FACTOR/FORMULA for critical values

critical values on # line



< below/− solution

ineq. not. $-1 < x < \frac{1}{3}$

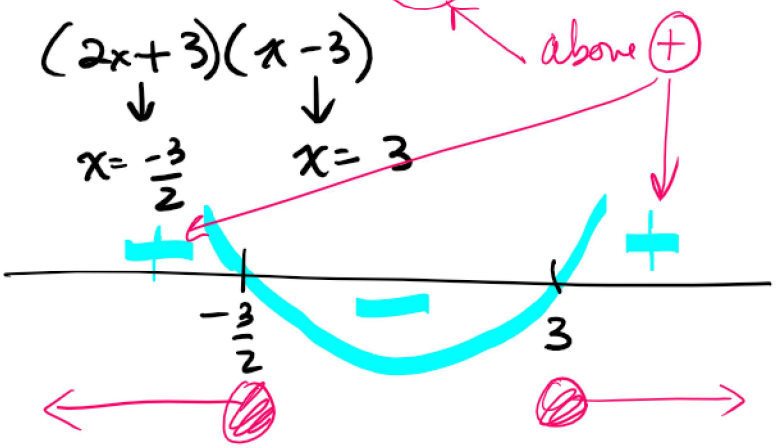
interval not. $(-1, \frac{1}{3})$

critical values on # line
- picture the parabola
- where is it above(+)/below(−)
- you could also calculate by picking a number in each interval to subst and check

ex 4 $2x^2 - 3x - 9 \geq 0$

$(2x+3)(x-3)$

x int. c.v. $x = -\frac{3}{2}$ $x = 3$



$x \leq -\frac{3}{2}$ $x \geq 3$ ineq.

$(-\infty, -\frac{3}{2})$ $(3, \infty)$ interval

p 372 # 3-5, 7-9