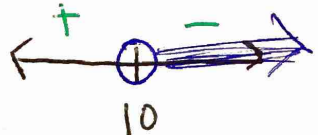
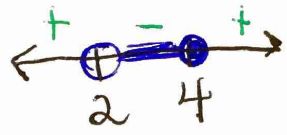
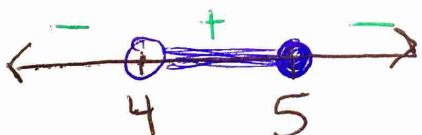


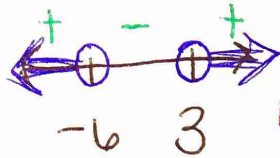
Rational and Quadratic Inequalities - Honors Math 3

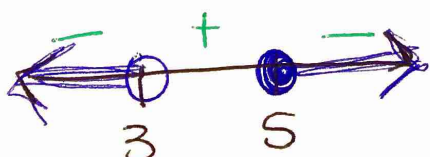
① $\frac{-2}{x-10} \leq 0$ critical vals: 10  $(10, \infty)$

② $\frac{x-4}{x-2} \leq 0$ critical vals: 2, 4  $(2, 4]$

③ $\frac{2x-7}{x-4} \geq 3$ $\frac{2x-7}{x-4} - 3 \geq 0$ $\frac{2x-7}{x-4} - \frac{3(x-4)}{x-4} \geq 0$
 eq: $x-4$

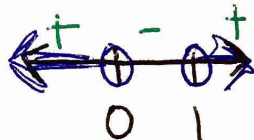
$\frac{2x-7-3x+12}{x-4} \geq 0$ $\frac{-x+5}{x-4} \geq 0$ critical vals: 4, 5 excl. val
 $(4, 5]$

④ $\frac{x+6}{x-3} > 0$ critical vals: -6, 3  $(-\infty, -6) \cup (3, \infty)$

⑤ $\frac{p-5}{3-p} \leq 0$ critical vals: 5, 3  $(-\infty, 3) \cup [5, \infty)$

$$\frac{x-1}{x} > 0$$

critical vals: 0, 1



$$(-\infty, 0) \cup (1, \infty)$$

$$\textcircled{7} \frac{-x+8}{x-2} \geq 5$$

$$\frac{-x+8}{x-2} - 5 \geq 0$$

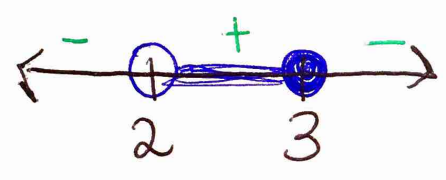
$$\frac{-x+8}{x-2} - \frac{5(x-2)}{x-2} \geq 0$$

CD: x-2

$$\frac{-x+8-5x+10}{x-2} \geq 0$$

$$\frac{-6x+18}{x-2} \geq 0$$

critical vals: 2, 3



$$(2, 3]$$

$$\textcircled{8} \frac{3x-1}{x} \leq -1$$

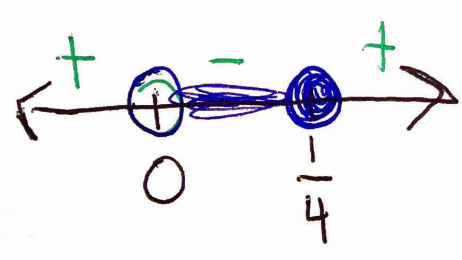
$$\frac{3x-1}{x} + 1 \leq 0$$

$$\frac{3x-1}{x} + \frac{x}{x} \leq 0$$

$$\frac{3x-1+x}{x} \leq 0$$

$$\frac{4x-1}{x} \leq 0$$

critical vals: 0, 1/4

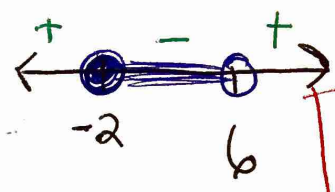


$$(0, \frac{1}{4}]$$

CHECK

$$\frac{3x+6}{2x-12} \leq 0$$

critical vals: -2, 6



$$[-2, 6)$$

$$\textcircled{10} \frac{n+3}{5-2n} > 4$$

$$\frac{n+3}{5-2n} - 4 > 0$$

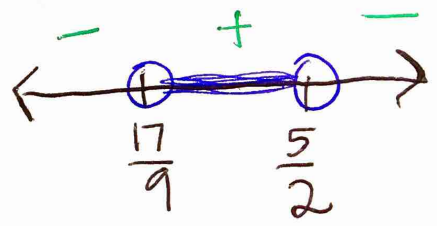
CD: $5-2n$

$$\frac{n+3}{5-2n} - \frac{4(5-2n)}{5-2n} > 0$$

$$\frac{n+3-20+8n}{5-2n} > 0$$

$$\frac{9n-17}{5-2n} > 0$$

critical values: $\frac{17}{9}, \frac{5}{2}$
(1.8) (2.5)



$$\left(\frac{17}{9}, \frac{5}{2}\right)$$

$$\textcircled{11} \frac{-2x+5}{x+6} \geq -2$$

$$\frac{-2x+5}{x+6} + 2 \geq 0$$

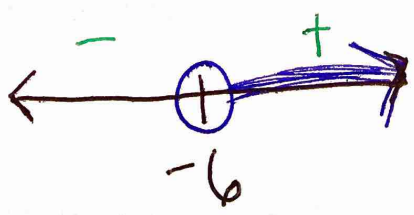
CD: $x+6$

$$\frac{-2x+5}{x+6} + \frac{2(x+6)}{x+6} \geq 0$$

$$\frac{-2x+5+2x+12}{x+6} \geq 0$$

$$\frac{17}{x+6} \geq 0$$

critical values: -6



$$[-6, \infty)$$

$$\frac{2}{x+3} \leq 1$$

$$\frac{2}{x+3} - 1 \leq 0$$

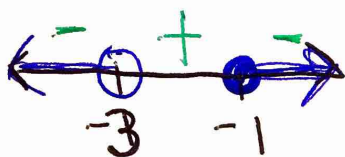
CD: $x+3$

$$\frac{2}{x+3} - \frac{1(x+3)}{x+3} \leq 0$$

$$\frac{2-x-3}{x+3} \leq 0$$

$$\frac{-x-1}{x+3} \leq 0$$

critical values: $-3, -1$



$$(-\infty, -3) \cup [-1, \infty)$$

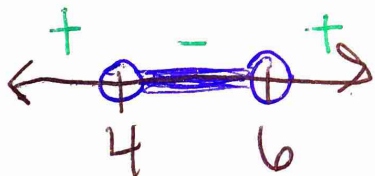
$$\textcircled{13} x^2 < 10x - 24$$

$$x^2 - 10x + 24 < 0$$

~~$$x^2 - 10x + 24 < 0$$~~

$$(x-6)(x-4) < 0$$

critical values: $6, 4$

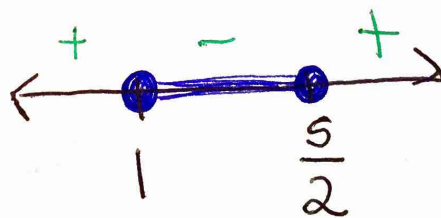


$$(4, 6)$$

$$\textcircled{14} 2x^2 - 7x + 5 \leq 0$$

$$(2x-5)(x-1) \leq 0$$

critical values: $1, \frac{5}{2}$

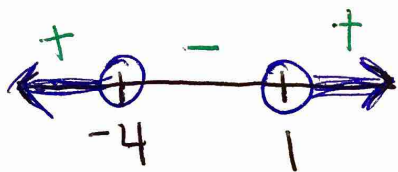


$$\left[1, \frac{5}{2}\right]$$

⑮ $x^2 + 3x > 4$

$x^2 + 3x - 4 > 0$

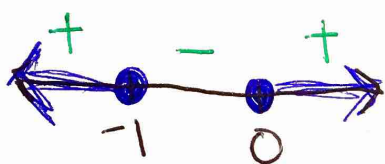
$(x+4)(x-1) > 0$ critical values: $-4, 1$



$(-\infty, -4) \cup (1, \infty)$

⑯ $x^2 + x \geq 0$

$x(x+1) \geq 0$ critical values: $0, -1$



$(-\infty, -1] \cup [0, \infty)$

⑰ $2x^2 - 6x - 3 \geq 0$

$(2x \quad)(x \quad) \geq 0$

DOES NOT FACTOR

USE COMPLETING THE SQUARE:

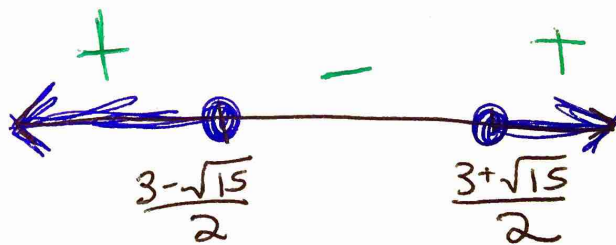
$x^2 - 3x - \frac{3}{2} \geq 0$

$x^2 - 3x + \frac{9}{4} \geq \frac{3}{2} + \frac{9}{4}$

$(x - \frac{3}{2})^2 \geq \frac{15}{4}$

$x - \frac{3}{2} \geq \pm \frac{\sqrt{15}}{2}$

critical values: $x \geq \frac{3 \pm \sqrt{15}}{2}$

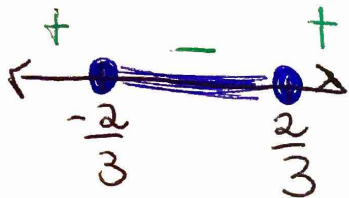


~ -4

~ 3.43

$(-\infty, \frac{3-\sqrt{15}}{2}] \cup [\frac{3+\sqrt{15}}{2}, \infty)$

$$9x^2 - 4 \leq 0$$

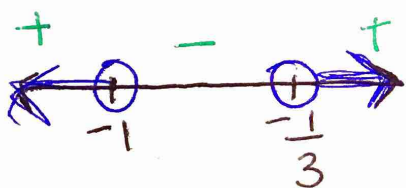


$$(3x-2)(3x+2) \leq 0$$

critical values: $\frac{2}{3}, -\frac{2}{3}$

$$\left[-\frac{2}{3}, \frac{2}{3}\right]$$

$$19) 3x^2 + 4x > -1$$



$$3x^2 + 4x + 1 > 0$$

$$(3x+1)(x+1) > 0$$

critical values: $-1, -\frac{1}{3}$

$$(-\infty, -1) \cup \left(-\frac{1}{3}, \infty\right)$$

$$20) x^2 + 2x \geq 4$$

$$x^2 + 2x - 4 \geq 0$$

DOES NOT FACTOR
USE COMPLETING THE SQUARE

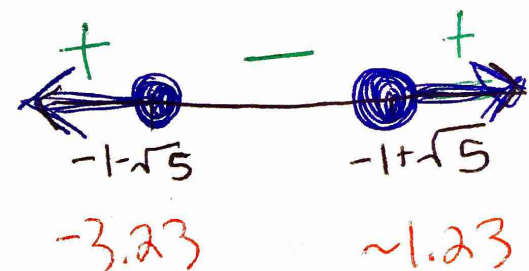
$$x^2 + 2x + \frac{1}{4} \geq 4 + \frac{1}{4}$$

$$(x+1)^2 \geq 5$$

$$(x+1) \geq \pm\sqrt{5}$$

$$x \geq -1 \pm \sqrt{5}$$

critical vals



$$(-\infty, -1-\sqrt{5}] \cup [-1+\sqrt{5}, \infty)$$