Notes Section 2.6 - Rational Inequalities

Solve

1. $\frac{x+6}{4x-3} \geq 1$

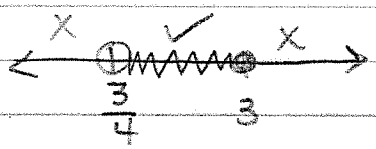
$\frac{x+6}{4x-3} - \frac{1(4x-3)}{4x-3} \geq 0$

$\frac{x+6-4x+3}{4x-3} \geq 0$

$\frac{-3x+9}{4x-3} \geq 0$

$-3x+9=0$ $\quad x \neq 3/4$

$x=3$



$(3/4, 3]$

2. $\frac{x^2-x-11}{x-2} \leq 3$

$\frac{x^2-x-11}{x-2} - \frac{3(x-2)}{x-2} \leq 0$

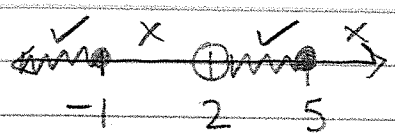
$\frac{x^2-x-11-3x+6}{x-2} \leq 0$

$$\frac{x^2-4x-5}{x-2} \leq 0$$

$x^2-4x-5=0$ $\qquad x \neq 2$

$(x-5)(x+1)=0$

$5, -1$



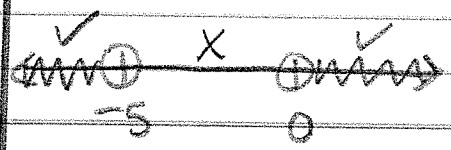
$(-\infty, -1]\,(2, 5]$

3. $\frac{1}{x} > \frac{1}{x+5}$

$$\frac{1(x+5)}{x(x+5)} - \frac{1(x)}{x+5(x)} > 0$$

$$\frac{x+5-x}{x(x+5)} > 0$$

$$\frac{5}{x(x+5)} > 0 \qquad x \neq 0 \quad x \neq -5$$



$(-\infty, -5)\,(0, \infty)$