121 §3.6 #113

(113) $w > \frac{w-5}{w-3}$

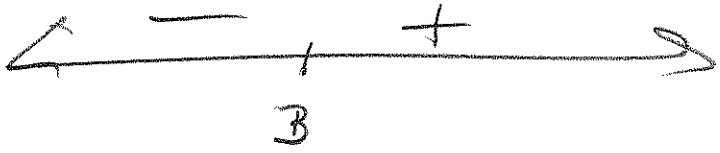
$$w - \frac{w-5}{w-3} > 0$$

$$\left(\frac{w}{1}\right)\left(\frac{w-3}{w-3}\right) - \frac{w-5}{w-3} > 0$$

$$\frac{w^2-3w-(w-5)}{w-3} > 0$$

$$\frac{w^2-3w-w+5}{w-3} > 0$$

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



$w \in (3, \infty)$

$w^2-4w+5=0$:

$a=1, b=-4, c=5$

$b^2-4(a)(c)$

$=(-4)^2-4(1)(5)$

$=16-20=-4$

No real roots in numerator.

$w=3$ is only critical #

121 §3.6 II #s 95–113

#s 95 – 114 solve the inequality

(95) $\frac{x-4}{x+2} \le 0$ $\quad$ $x \in (-2, 4]$

$2 \notin D$

+ | − | +

−2 $\quad$ 4

$f(0) = \frac{-4}{2} = -2 < 0$ " — "

(97) $\frac{g-2}{g+3} < 2$

$\frac{g-2}{g+3} - 2 < 0$

$\frac{g-2-2(g+3)}{g+3} < 0$

$\frac{g-2-2g-6}{g+3} < 0$

$\frac{-g-8}{g+3} < 0$

$f(0) = -\frac{8}{3}$ " — "

−8 $\quad$ −3 $\quad$ −

from g-ist finish

− | + | −

−8 $\quad$ −3

$\Rightarrow x \in (-\infty, -8) \cup (-3, \infty)$

(99) $\frac{w^2-w-6}{w-6} \ge 0$

$\frac{(w-3)(w+2)}{w-6} \ge 0$

− | + | − | +

−2 $\quad$ 3 $\quad$ 6

$\Rightarrow x \in [-2, 3] \cup (6, \infty)$

$6 \notin D$

121 §3.6 II #s 101-113

(101) $\frac{1}{x+2} > \frac{1}{x-3}$

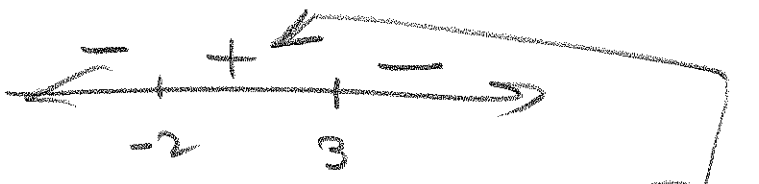
$\frac{1}{x+2} - \frac{1}{x+3} > 0$

$\left(\frac{1}{x+2}\right)\left(\frac{x-3}{x-3}\right) - \left(\frac{1}{x-3}\right)\left(\frac{x+2}{x+2}\right) > 0$

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

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

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



$f(0) = \frac{-5}{(2)(-3)} = \frac{-5}{-6} = \frac{5}{6}$ "+"

$x \in (-2, 3)$

(103) $x < \frac{3x-8}{5-x}$

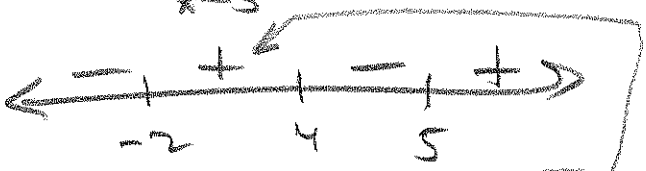
$(x)\left(\frac{5-x}{5-x}\right) - \frac{3x-8}{5-x} < 0$

$\frac{5x-x^2-3x+8}{5-x} < 0$

$(-1)(-1)\left(\frac{-x^2+2x+8}{5-x}\right) < 0$

$\frac{x^2-2x-8}{x-5} < 0$

$\frac{(x-4)(x+2)}{x-5} < 0$



$f(0) = \frac{-8}{-5} = \frac{8}{5}$ "+"

$x \in (-\infty, -2) \cup (4, 5)$

121 §3.6 II #s 105-113

(105) $\frac{(x-3)(x+1)}{x-5} \geq 0$

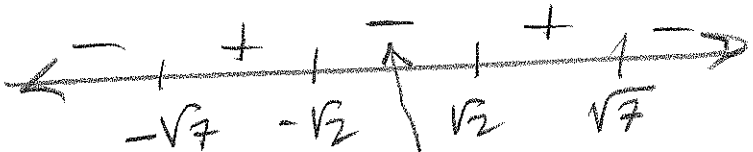
$f(0) = \frac{(-3)(1)}{(-5)}$ "+"

$x \in [-1,3] \cup (5,\infty)$

$5 \notin D$

(107) $\frac{x^2-7}{2-x^2} \geq 0$

$\frac{(x-\sqrt{7})(x+\sqrt{7})}{(\sqrt{2}-x)(\sqrt{2}+x)} \geq 0$



$f(0) = \frac{-7}{2}$ "−"

$x \in [-\sqrt{7},-\sqrt{2}) \cup (\sqrt{2},\sqrt{7}]$

$\pm\sqrt{2} \notin D$

(109) $\frac{x^2+2x+1}{x^2-2x-15} \geq 0$

$\frac{(x+1)^2}{(x-5)(x+5)} \geq 0$

$x=-1$ has $m=2$ (Don't change sign.)

$x \in (-\infty,-5) \cup \{-1\} \cup (5,\infty)$

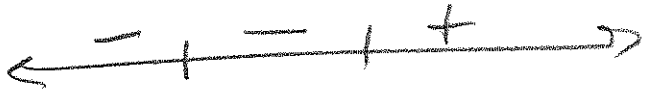
$x=5 \notin D$

$x=1$ is one spot where $u=0$, is satisfied ≥ 0!

(111) $\frac{1}{w} > \frac{1}{w^2}$

$\frac{1}{w}\cdot\frac{w}{w} - \frac{1}{w^2} > 0$

$\frac{w-1}{w^2} > 0$



$w \in (1,\infty)$