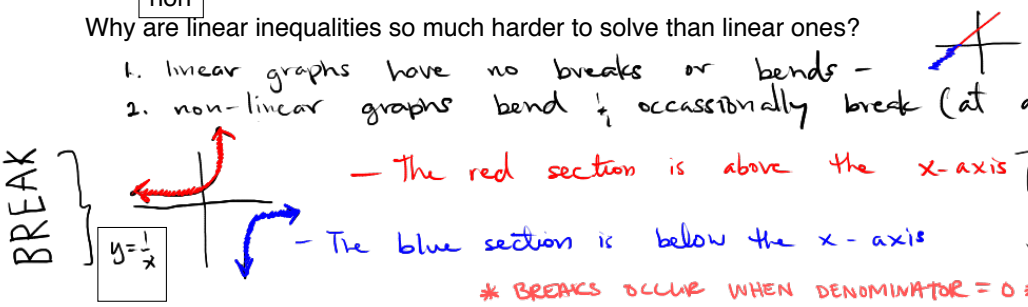
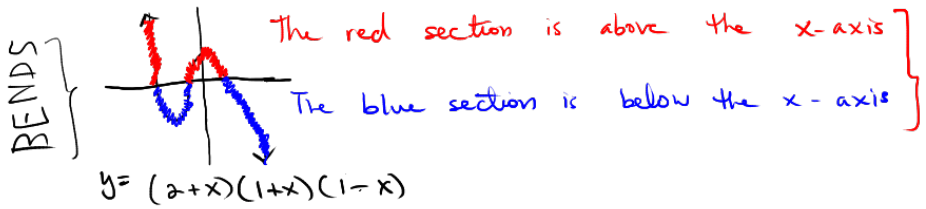
non

Why are linear inequalities so much harder to solve than linear ones?

1. linear graphs have no breaks or bends –
2. non-linear graphs bend & occassionally break (at asymptotes)



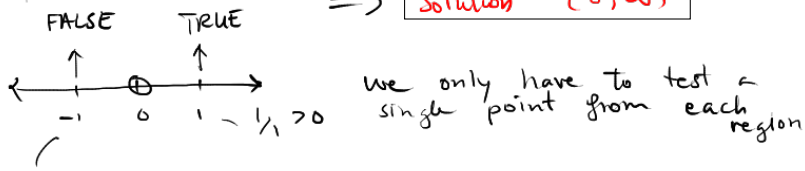


To solve these inequalities we find the breaks (set den = 0) & zeros (num = 0)

Solve $\frac{1}{x} > 0$.

step 1: set $x=0$.

step 2: test the inequality away from $x=0$



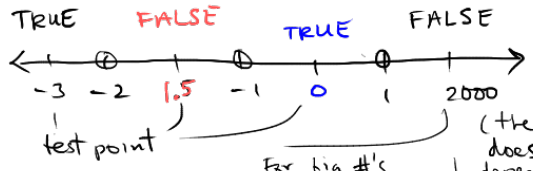
$\Rightarrow$ Solution $(0, \infty)$

Solve $(2+x)(1+x)(1-x) > 0$

step 1: solve $2+x=0$, $1+x=0$, $1-x=0$

$x=-2$, $x=-1$, $x=1$

step 2: test the inequality away from these points



Solution

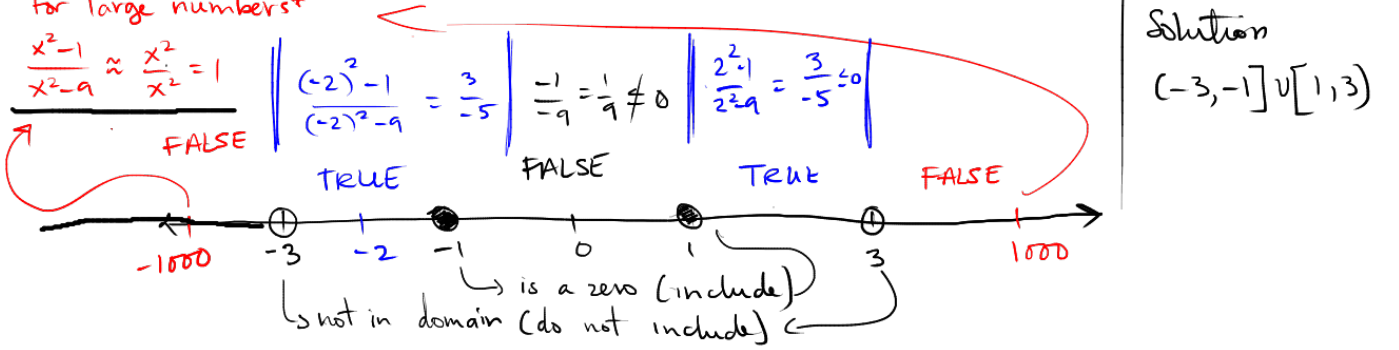
$(-\infty, -2) \cup (-1, 1)$

$\Leftarrow$

Example: $\frac{x^2-1}{x^2-9} \leq 0$

zeros: $x^2-1=0$, $x=\pm 1$

BREAKS $x^2-9=0$, $x=\pm 3$



Solution

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