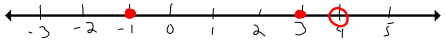
NOV 2/07

QUADRATIC INEQUALITIES CONT...
PART DEUX

Ex. $\dfrac{(x+1)(x-3)^2}{x-4} \leq 0$

CRITICAL NUMBERS $-1, 3, 4$



① $x \leq -1$ TEST $x = -2$

$(x+1)(x-3)(x-3)(x-4)$

$-\quad -\quad -\quad -$ } +ve FALSE

② $-1 \leq x \leq 3$ TEST $x = 0$

$(x+1)(x-3)(x-3)(x-4)$

$+\quad -\quad -\quad -$ } -ve TRUE

③ $3 \leq x < 4$ TEST $= 3\frac{1}{2}$

$(x+1)(x-3)(x-3)(x-4)$

$+\quad +\quad +\quad -$ } -ve TRUE

④ $x > 4$ TEST $x = 5$

$(x+1)(x-3)(x-3)(x-4)$

$+\quad +\quad +\quad +$ } +ve FALSE

SOLN $[-1, 3] \cup [3, 4)$

OR

$[-1, 4)$

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

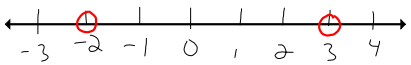
$\frac{x}{x-3} - \frac{1}{x+2} > 0$ LCD $(x-3)(x+2)$

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

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

$\frac{x^2+x+3}{(x-3)(x+2)} > 0$ ← DISCRIMINANT −VE NO ROOTS

CRITICAL NUMBERS 3 & −2



① $x < -2$ TEST $x = -3$

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

$+ \quad - \quad -$ } +ve TRUE

② $-2 < x < 3$ TEST $x = 0$

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

$+ \quad + \quad -$ } -ve FALSE

③ $x > 3$ TEST $x = 4$

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

$+ \quad + \quad +$ } +ve TRUE

SOLN $(-\infty, -2) \cup (3, \infty)$

Absolute Value Inequalities

Statement	Equivalent Statement
$\lvert ax+b \rvert = c$	$ax+b=c$ or $ax+b=-c$
$\lvert ax+b \rvert < c$	$-c < ax+b < c$
$\lvert ax+b \rvert > c$	$ax+b < -c$ or $ax+b > c$

Ex Solve $|x-1| > 7$

$x-1 < -7$ $\quad$ $x-1 > 7$

$x < -6$ or $x > 8$

Ex Solve $|2x+1| \leq |-7|$

$-7 \leq 2x+1 \leq 7$

$-8 \leq 2x \leq 6$

$-4 \leq x \leq 3$

Ex #28 Q# 1-3, 5-12