

# Solving Rational Inequalities 2

WS 2

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

$(x-3)(x-2)$

$(2,3) \cup (5,8)$

√0:  
-5  
(-3)(2)  
-5  
Neg:  $\ddot{}$

2 1/25  
-2.5  
(-5.5)(.5)  
Pos  $\smile$

3 1/4  
-1  
(1)(2)  
Neg  $\ddot{}$

5 1/6  
1  
3(4)  
Pos  $\smile$

2.  $\frac{4}{x} + \frac{3x}{x} \geq 0$

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

$(-\infty, -\frac{4}{3}] \cup [0, \infty)$

√-2:  
-2  
-2  
Pos  $\smile$

-4/3  
3  
4-3  
1  
Neg  $\ddot{}$

0  
4+3  
Pos  $\smile$

3.  $(2x+1)(3x+1) < (x-1)(3x+1)$

$(2x+1)(3x+1) - (x-1)(3x+1) < 0$

$(6x^2 + 5x + 1) - (3x^2 + 2x + 1) < 0$

$3x^2 + 7x + 2 < 0$

$(3x+1)(x+2) < 0$

√-3:  
-2  
-8(-)  
Pos  $\ddot{}$

√-1:  
-1/3  
(-2)(1)  
Neg  $\ddot{}$

√3:  
10(5)  
Pos  $\ddot{}$

$(-2, -1/3)$

4.  $\frac{3x}{x-1} - 1 > 0$

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

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

√-1:  
-1  
-2  
Pos  $\smile$

√0:  
1  
1  
Neg  $\ddot{}$

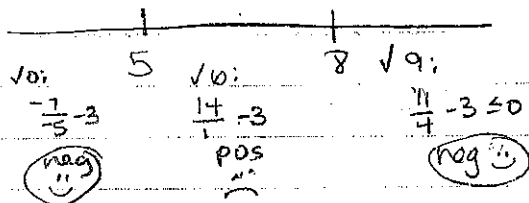
√2:  
5/2  
Pos  $\smile$

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

$$5. \frac{2x-7}{x-5} - 3 \leq 0 \quad (x-5)$$

$$\frac{2x-7}{x-5} + \frac{-3x+15}{x-5} \leq 0$$

$$\frac{-x+8}{x-5} \leq 0$$



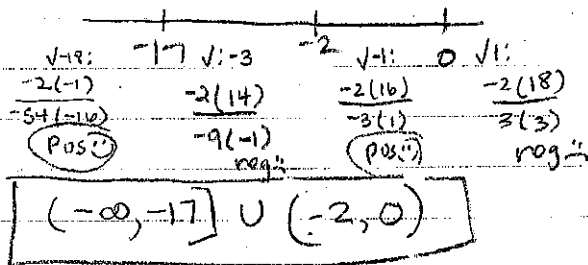
$$(-\infty, 5) \cup [8, \infty)$$

$$6. \frac{5^{3x}}{(x+2)} - \frac{5^{3(x+2)}}{x} - \frac{2^{(x+2)}}{3x} \geq 0$$

$$\frac{5^x}{3x(x+2)} + \frac{-5^x+30}{3x(x+2)} + \frac{-2^x+4}{3x(x+2)} \geq 0$$

$$\frac{-2x-34}{3x(x+2)} \geq 0$$

$$\frac{-2(x+17)}{3x(x+2)} \geq 0$$



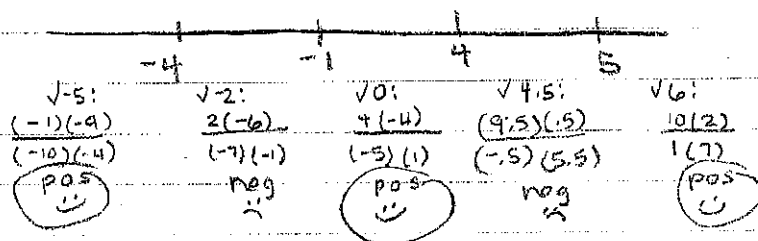
$$(-\infty, -17] \cup (-2, 0)$$

$$7. \frac{(x+4)(x-4)}{(x-5)(x+1)} > 0$$

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

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

$$(5, \infty)$$



$$8. \quad \frac{1 - 2x}{x-3} - \frac{1}{x+3} \leq 0$$

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

$$\frac{x^2 - 9 - 2x^2 - 6x - x + 3}{(x+3)(x-3)} \leq 0$$

$$\frac{-x^2 - 7x - 6}{(x+3)(x-3)} \leq 0$$

$$\frac{-(x^2 + 7x + 6)}{(x+3)(x-3)} \leq 0$$

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

$\sqrt{-4}$	$-6$	$\sqrt{-1}$	$-3$	$\sqrt{-2}$	$-1$	$\sqrt{0}$	$\frac{1}{3}$	$\sqrt{4}$
$\frac{-(-1)(-6)}{(-4)(-10)}$		$\frac{-(-2)(-3)}{(-1)(-7)}$		$\frac{-(-4)(-2)}{(1)(-5)}$		$\frac{-(-6)(1)}{(3)(-3)}$		$\frac{-(10)(5)}{7(1)}$
neg		pos		neg		pos		neg

$$(-\infty, -6] \cup (-3, -1] \cup (3, \infty)$$