

Sec 3.6.3

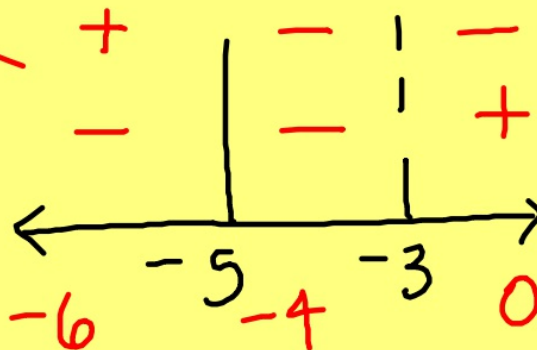
Solving Rational Inequalities

1. set = to zero
2. get a common denominator
3. condense to a single fraction
4. determine the boundary points & test

$$\frac{-x-5}{x+3} \geq 0$$

positive or zero

CNs $\rightarrow -3, -5$



$\equiv [-5, -3)$

What number causes the numerator and denominator to be equal to zero? These are the critical numbers.

Answer

Answer if I changed the inequality to less than 0.
 $\downarrow (-\infty, -5) \cup (-3, \infty)$

Determine all values that satisfy the following inequality-

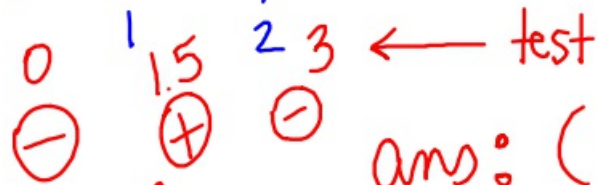
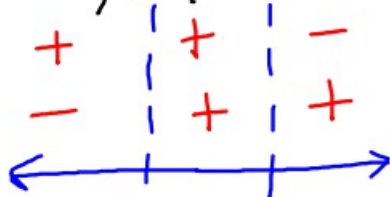
$$\frac{x}{x-1} > 2$$

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

$$\frac{x}{x-1} - 2 \left(\frac{x-1}{x-1} \right) > 0 \quad \leftarrow \text{Common denominator}$$

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

$$\frac{-x + 2}{x-1} > 0 \quad \leftarrow \text{critical #'s at 1 \& 2}$$



Ans: (1, 2)

A ball is thrown vertically upward from the top of a 190 foot tower with an initial velocity of 96 feet/second. During which time period will the ball's height exceed that of the tower?

Use- $s(t) = -16t^2 + v_0t + s_0$

...s(t) determines height above ground, where v_0 is the initial velocity, t is time (seconds) and s_0 is the initial height (feet)

(0, 6)
 between 0
 & 6 seconds

$$s(t) = -16t^2 + 96t + 190$$

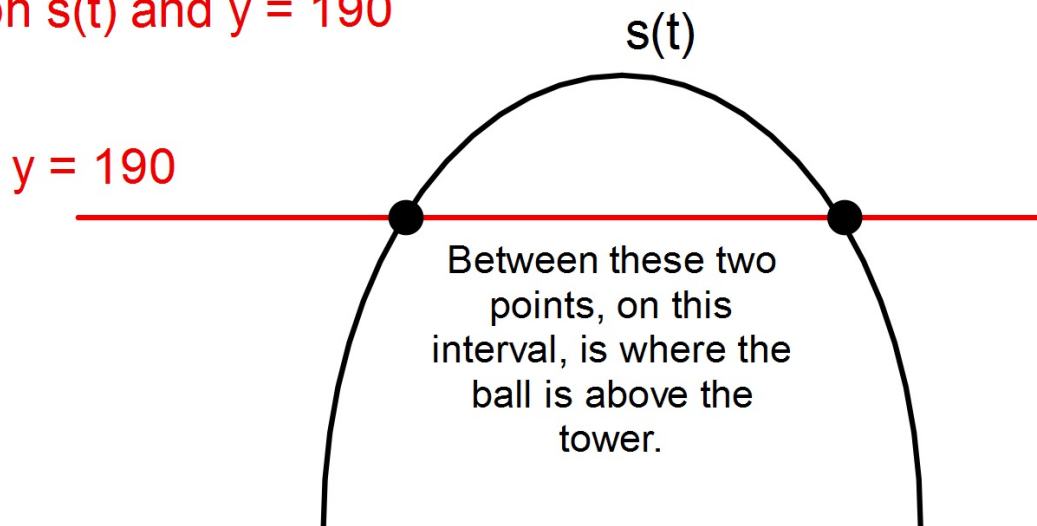
$$-16t^2 + 96t + 190 > 190$$

$$-16t^2 + 96t > 0$$

$$16t(t - 6) > 0$$

(+)	(-)	(-)	(-)	(-)	(+)
	0		6		
(-)		(+)		(-)	
(-)		(+)		(-)	

Check with a graph...
graph $s(t)$ and $y = 190$



Several ways to determine- table,
math/intersect menu and, my
preferred, "trace".

Suggested Practice

Sec 3.6

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43, 49, 55, 57, ~~75~~, ~~76~~

$$43. (-\infty, -3) \cup (4, \infty)$$

$$51. (-\infty, +\frac{1}{2}) \cup \left[\frac{7}{5}, \infty \right)$$

$$49. (-\infty, -\frac{4}{3}) \cup [2, \infty)$$

75. between
0 and $\frac{1}{2}$

$$55. (-\infty, -5) \cup (-3, \infty)$$

76. between 0
and 3

