Section 2.4: Inequalities

Wednesday, October 09, 2013
9:26 AM

examples:

$$2x + y > x + 3$$

$$y \leq 5$$

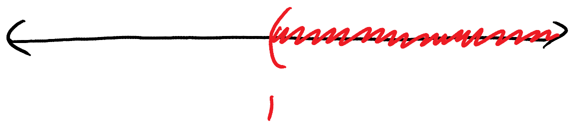
$$3x \geq 6$$

$$z < x + 3$$

let's consider the following

$$x + 2 > 3$$

if you solve this, you get $x > 1$
and the solution set is then



or $(1, \infty)$ in interval notation

so, how do you solve inequalities?

is $2 < 3$ true or false?

what about

$2 + 5 < 3 + 5$ T

$2 + 5 < 3 + 5$ T

$2 - 5 < 3 - 5$ T

$2 \cdot 5 < 3 \cdot 5$ T

$2 \cdot (-5) < 3 \cdot (-5)$ F

properties of inequality:

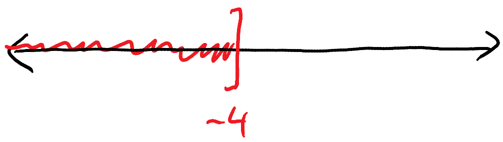
- adding the same number to both sides of an inequality does not change the solution set
- multiplying both sides of an inequality by the same positive number does not change the solution set
- multiplying both sides of an inequality by the same negative number requires that you "flip" the inequality sign to keep the same solution set

examples: Solve the following inequalities, and then state the solution set in interval notation. Also, graph it.

$19 \leq 3 - 4x$

$16 \leq -4x$	$19 + 4x \leq 3$
$-4 \geq x$	$4x \leq -16$
$x \leq -4$	$x \leq -4$

$x \leq -4$ | $x \leq -4$



$(-\infty, -4]$

$$-1 < \frac{7-5x}{-2}$$

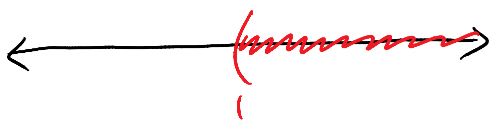
$$2 > 7 - 5x$$

$$-5 > -5x$$

$$1 < x$$

$$x > 1$$

$(1, \infty)$



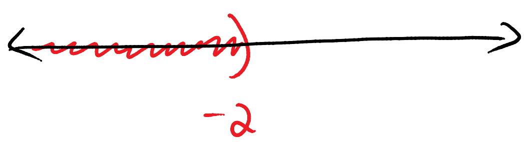
$$6\left(\frac{1}{3}x - \frac{1}{6}\right) < \left(\frac{1}{6}x - \frac{1}{2}\right) \cdot 6$$

LCD: 6

$$2x - 1 < x - 3$$

$$x < -2$$

$(-\infty, -2)$



brain teasers:

$$2x+3 > 2(x-4)$$

$$2x+3 > 2x-8$$

$$3 > -8$$

$(-\infty, \infty)$

$$-4(2x-5) \le 2(6-4x)$$

$$-8x+20 \le 12-8x$$

$$20 \le 12$$

$\emptyset$