T for both

Algebra 1 5.4

Solve compound inequalities (and/or)

Graph solution sets of compound inequalities

- To ride certain roller coasters, you must be at least 52 inches tall, and your height cannot exceed 72 inches. If h represents the height of a rider, we can write two inequalities to represent this.

inequality

greater than

less than

Venn diagram

intersection

union

compound inequality

You need to know the code...

Example 1 Solve and Graph an Intersection

Solve $-2 \leq x - 3 < 4$. Then graph the solution set.

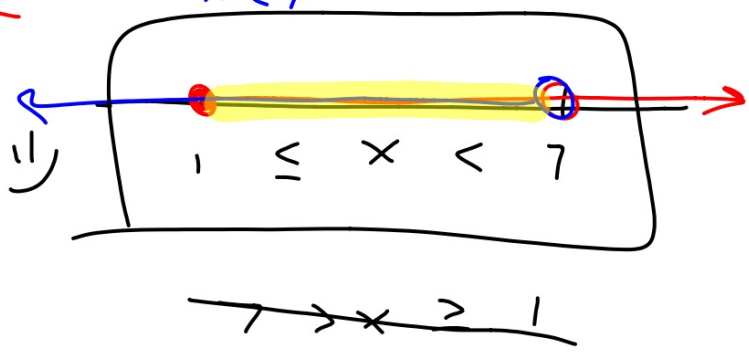
Write 2 separate inequalities...

$-2 \leq x - 3$ and $x - 3 < 4$

$+3 \quad +3$ $\quad +3 \quad +3$

$+1 \leq x$ $\quad x < 7$

$x \geq 1$



$7 > x \geq 1$

2 Inequalities Containing *or* Another type of compound inequality contains the word *or*. A compound inequality containing *or* is true if at least one of the inequalities is true. Its graph is the **union** of the graphs of two inequalities.

T for at least 1

Whiteboard TRUE for at least one

Solve each compound inequality. Then graph the solution set.

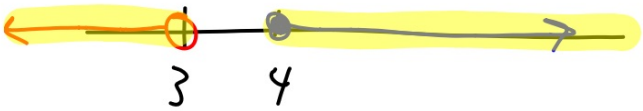
3A. $a + 1 < 4$ or $a - 1 \geq 3$

:

$a + 1 < 4$
$-1 \quad -1$
$a < 3$

or

$a - 1 \geq 3$
$+1 \quad +1$
$a \geq 4$



3B. $x \leq 9$ or $2 + 4x < 10$

$x \leq 9$

$-2 \quad -2$

$4x < 8$

$\frac{4x}{4} < \frac{8}{4}$

$x < 2$

Real-World Example 2 Write and Graph a Compound Inequality

SOUND The human ear can only detect sounds between the frequencies 20 Hertz and 20,000 Hertz. Write and graph a compound inequality that describes the frequency of sounds humans cannot hear.

Whiteboard practice

(and)

$2 \leq x - 3 < 8$

$-1 < n + 6 \leq 2$

$n > 6$ or $n + 1 < -9$

$-1 \quad -1$