1.7 Absolute Value Inequalities.

which is bigger:

① $\{x \mid x \text{ is smart and } x \text{ is rich}\}$

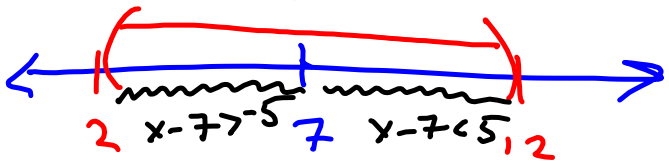
② $\{x \mid x \text{ is smart or } x \text{ is rich}\}$?

"and" restricts

"or" includes

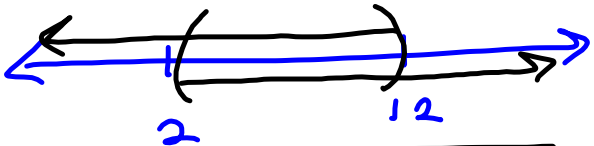
$|x-7| < 5$

$x-7$



$x-7<5$ AND $x-7>-5$

$x<12$ AND $x>2$

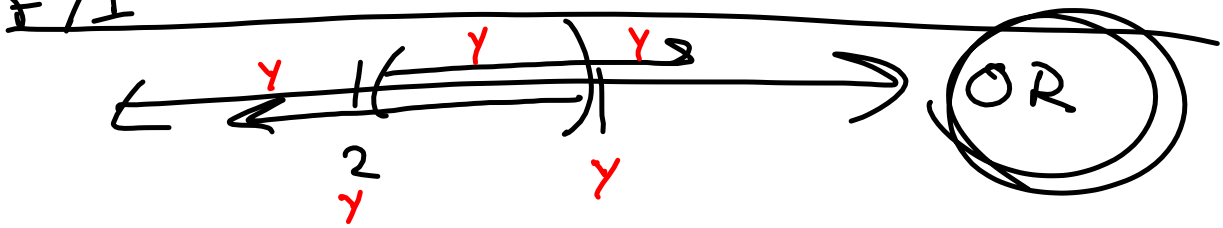


AND

Need BOTH conditions satisfied

$x \in (2,12)$

FYI



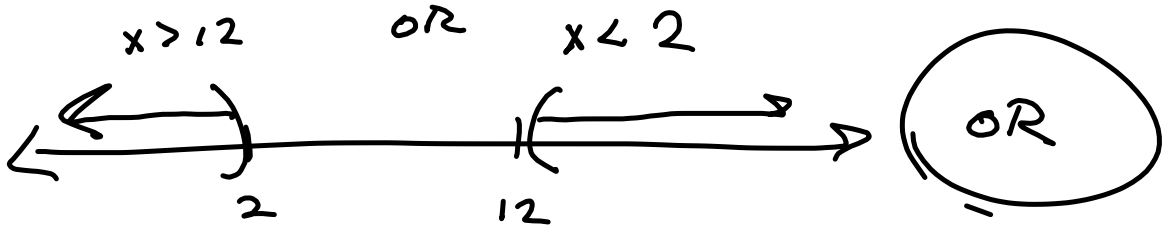
All real numbers satisfy this "OR" $= \{x \mid x \in \mathbb{R}\}$

$\forall x \in \mathbb{R} = (-\infty, \infty)$

$|x-7| > 5$

$x-7 > 5$ OR $x-7 < -5$

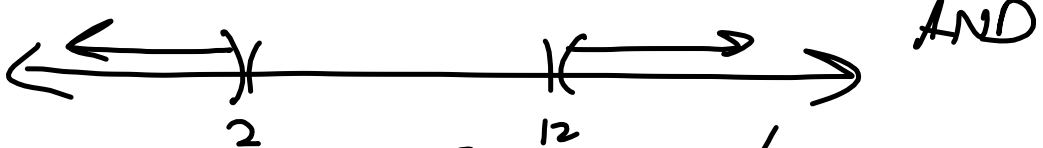
$x > 12$ OR $x < 2$



$x \in (-\infty, 2) \cup (12, \infty)$

FYI

$x > 12$ AND $x < 2$



No Solution!