

ABSOLUTE VALUES

$$|2| = 2$$

$$|-2| = 2$$

$$|-2| = -(-2) = 2$$

$$|x| = \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0 \end{cases}$$

$$\text{EX: } |x| = 3 \Rightarrow \begin{cases} x = 3 \\ \text{or} \\ x = -3 \end{cases}$$

PROPERTY $|x| = a \Rightarrow \begin{cases} x = a \\ \text{or} \\ x = -a \end{cases}$

$$\text{EX: } |x+3| = 5$$

$$x+3 = 5$$

$$\boxed{x = 2}$$

or

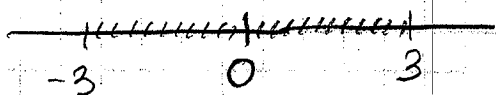
$$x+3 = -5$$

or

$$\boxed{x = -8}$$

INEQUALITIES WITH ABSOLUTE VALUES

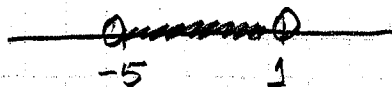
$$\text{EX: } |x| < 3 \Rightarrow -3 < x < 3$$



$$\text{Property: } |x| \leq a \Rightarrow -a \leq x \leq a$$

$$\text{EX: } |x+2| < 3 \Rightarrow -3 < x+2 < 3 \Rightarrow$$

$$\Rightarrow -5 < x < 1$$



$$\text{solution: } (-5, 1)$$

$$\text{EX: } |x| > 3 \Rightarrow x > 3 \text{ or } x < -3$$

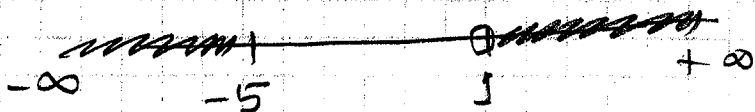


$$\text{property: } |x| \geq a \Rightarrow \begin{cases} x \geq a \\ \text{or} \\ x \leq -a \end{cases}$$

$$\text{EX } |x+2| > 3$$

$$x+2 > 3 \quad \text{or} \quad x+2 < -3$$

$$x > 1 \quad \text{or} \quad x < -5$$



$$\text{solution: } (-\infty, -5) \cup (1, +\infty)$$