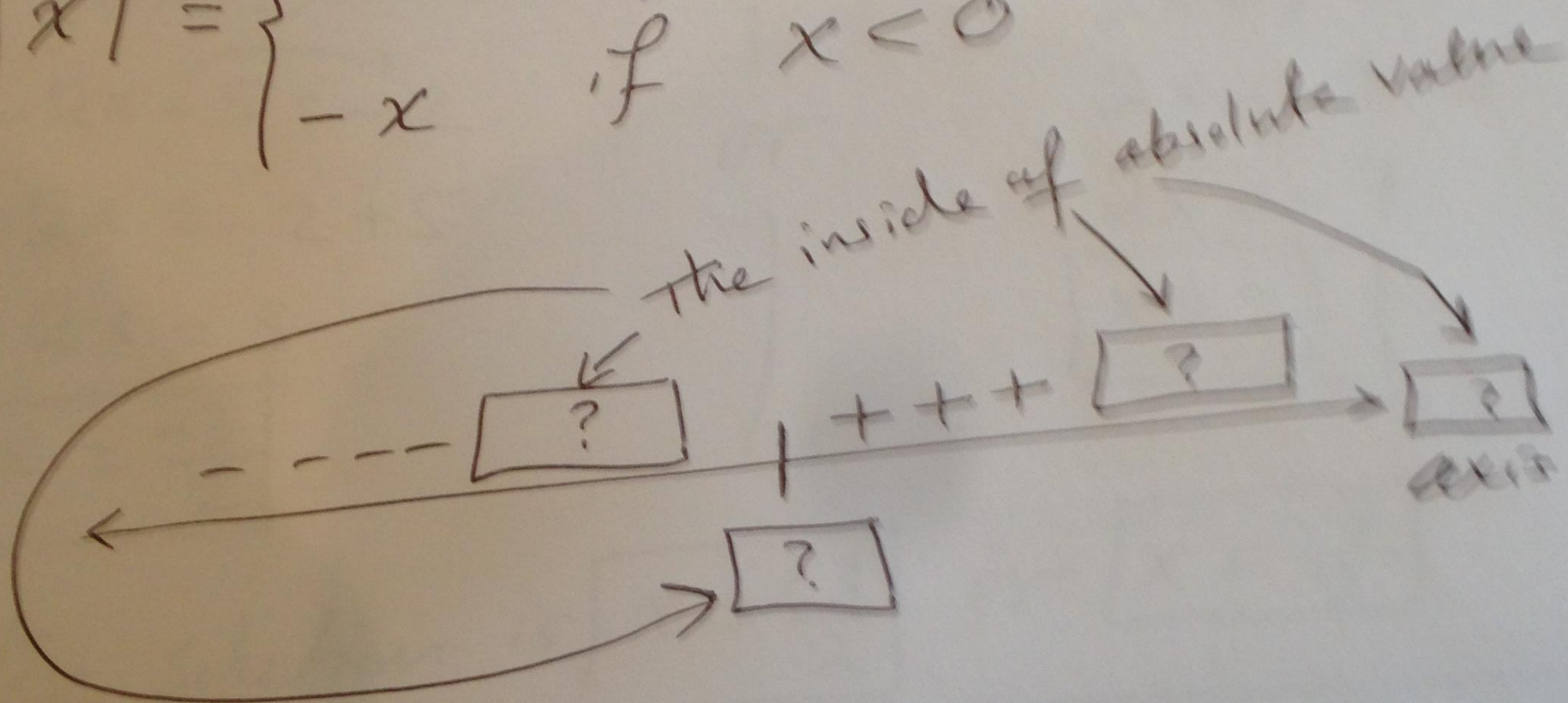


\* Definition of Absolute Value :-

For any real number, say  $x$ , then we have :-

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



Ex1) Solve for  $|3-x|=5$

Solution:

$$|3-x|=5$$

So, the solution is  $x=8$  or  $x=-2$ .

$$\begin{aligned} -(3-x) &= 5 \\ -3+x &= 5 \\ x &= 5+3=8 \\ \boxed{x=8} \end{aligned}$$

$$\begin{aligned} \text{or} \quad + (3-x) &= 5 \\ 3-x &= 5 \\ -x &= 5-3=2 \\ \boxed{x=-2} \end{aligned}$$



Ex 2) solve for  $|2x + 5| = -2$

Solution

$$|2x + 5| = -2$$

$$-(2x + 5) = -2$$

$$-2x - 5 = -2$$

$$-2x = -2 + 5$$

$$-2x = 3$$

$$x = \frac{-3}{2}$$

$$+(2x + 5) = -2$$

$$2x + 5 = -2$$

$$2x = -2 - 5$$

$$2x = -7$$

$$x = \frac{-7}{2}$$

or

The solution is  $x = \frac{-3}{2}$  or  $x = \frac{-7}{2}$ .

Ex 3) solve for  $|2x - 1| \geq 5$

The solution is  $x \leq -2$  or  $x \geq 3$

Solution

$$|2x - 1| \geq 5$$

$$-(2x - 1) \geq 5$$

$$-2x + 1 \geq 5$$

$$-2x \geq 4 \Rightarrow x \leq -2$$

or

$$+(2x - 1) \geq 5$$

$$2x - 1 \geq 5$$

$$2x \geq 5 + 1$$

$$2x \geq 6$$

$$x \geq \frac{6}{2} \Rightarrow x \geq 3$$