

$$|x| = \sqrt{x^2}$$

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

①

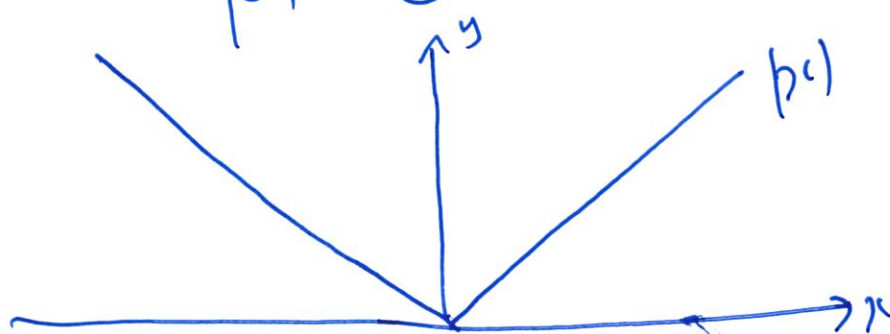
What is $f(5) = -(-5) = +5$.

$$|8| = 8$$

$$|-\pi| = -(-\pi) = +\pi$$

$$|-\frac{1}{3}| = -(-\frac{1}{3}) = \frac{1}{3}$$

$$|0| = 0$$



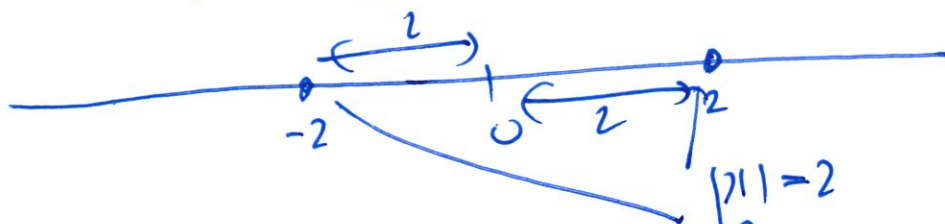
Symmetrical about the y axis.

$|x| \geq 0$ & only 0 when $x=0$.

Solve $|x|=2 \Rightarrow x=2, -2$.

Soln: If $x \geq 0$ $x=2$

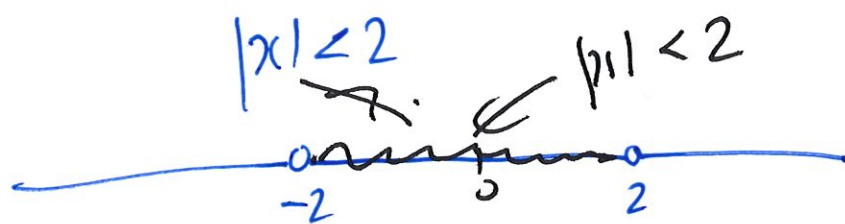
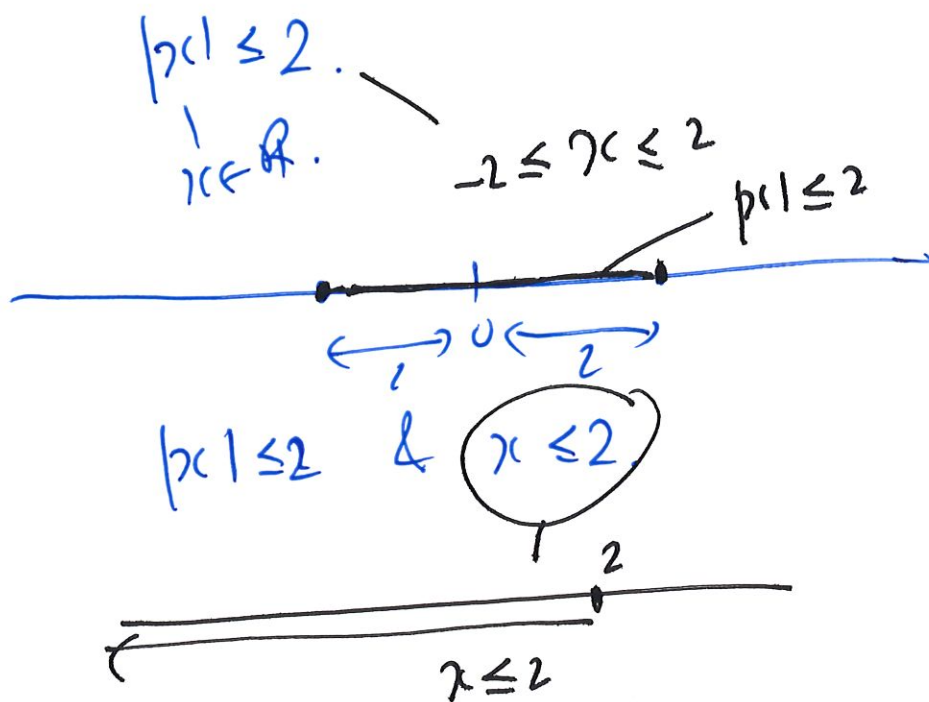
$x < 0$ $x=-2$



The distance from 0
is 2.

Inequalities of Modulus Function

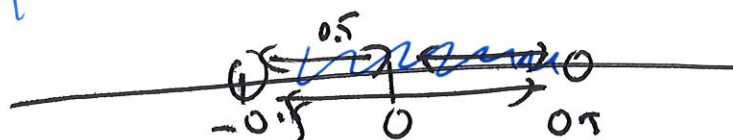
(2)



$$|x| < 2 \text{ is } \{x \in \mathbb{R} \mid -2 < x < 2\}$$

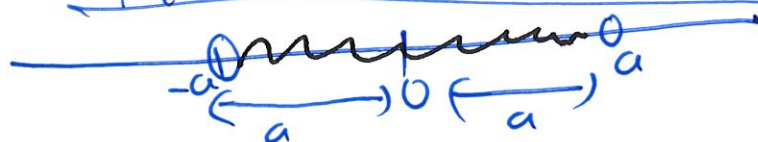
$$\implies -2 < x < 2$$

Solve $|x| < 0.5$.



$$-0.5 < x < 0.5$$

$$|x| < a \iff -a < x < a$$

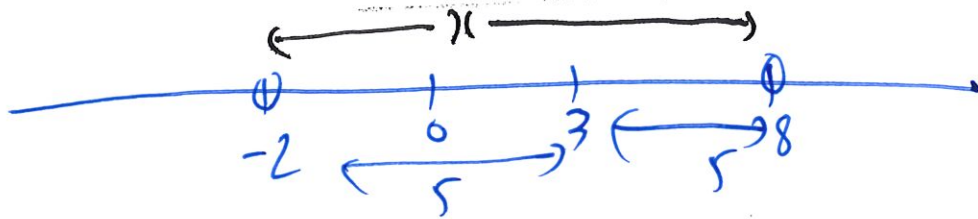


Solve $|x-3| < 5$.

(3)

Soln: $-5 < x-3 < 5$

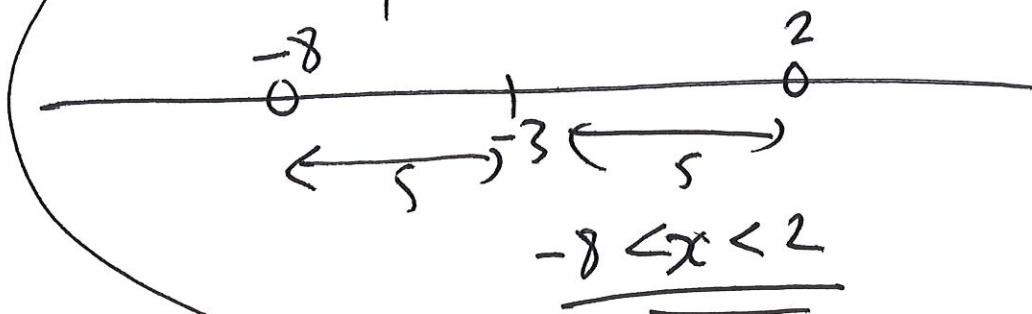
$$-2 < x < 8$$



Solve: $|2x+3| < 5$

$$|2x+3| < 5$$

$$|x - (-3)| < 5 \Rightarrow$$



$$-5 < 2x+3 < 5$$

$$-8 < x < 2$$

Solve $|2x+3| < 5$.

Soln: $-5 < 2x+3 < 5$

$$-8 < 2x < 2$$

$$-4 < x < 1$$