

Intervals الفترات

① close Interval

$$[a, b] \quad [a \leq x \leq b]$$

a, b هي اعداد ثابتة، هاتنقطة نهاية
ويجب انهما بدائرة مغلقة على خط الاعداد

② open Interval

$$(a, b) \quad (a < x < b)$$

a, b اعداد ثابتة ليس هاتنقطة نهاية
ويجب انهما بدائرة مفتوحة على خط الاعداد

③ Half open or Half close Interval.

$$(a, b] \quad a < x \leq b$$

$$[a, b) \quad a \leq x < b$$

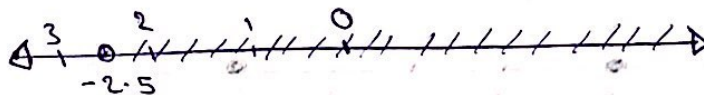
ex. / ① Find the Interval for x

$$2x - 7 < 4x - 2$$

$$2x - 4x < -2 + 7$$

$$-2x < 5 \quad] \div -2$$

$$x > \frac{-5}{2} \Rightarrow x > -2.5$$



$$(-2.5, \infty)$$

$$\text{ex 2/ } 2x - 4 \leq 6 - 7x \leq 3x + 6$$

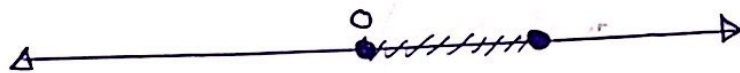
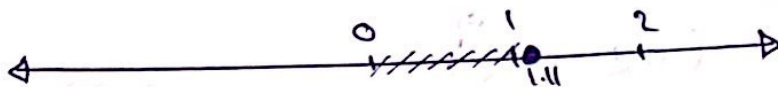
$$2x - 4 \leq 6 - 7x \cap 6 - 7x \leq 3x + 6$$

$$2x + 7x \leq 4 + 6 \cap -7x - 3x \leq 6 + 6$$

$$9/ 9x \leq 10 \cap -10 \leq 0 / -10$$

$$x \leq \frac{10}{9} \cap x \geq 0$$

$$x \leq 1.11 \cap x \geq 0$$



$$1.11 \leq x \leq 0$$

$$[1.11, 0]$$

$$\text{ex 3/ Solve } \{x : x^2 \leq 4\}$$

$$x^2 \leq 4 \Rightarrow x^2 - 4 \leq 0$$

$$(x - 2)(x + 2) \leq 0 \quad \text{or} \quad x^2 \leq \pm 2$$

$$\text{either } x = 2$$

$$\text{or } x = -2$$



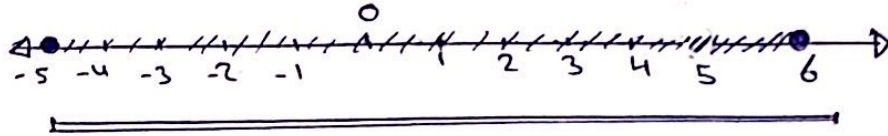
The interval is $[-2, 2]$

ex 4/ Solve $x^2 - x - 30 \leq 0$

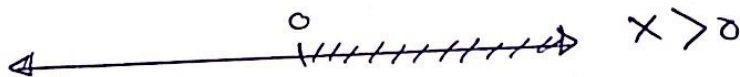
$$(x - 6)(x + 5) \leq 0$$

either $x = 6$ or $x = -5$

the interval is $\{x: x \rightarrow -5 \leq x \leq 6\}$
or $[-5, 6]$



ex 5/ Solve $\{x: x < 0\} \cap \{x: x > 0\}$



\therefore the Interval is \emptyset

ex 6/ $5x - 4 + 8x - 1 \leq 8x - 3 - 3x + 2$

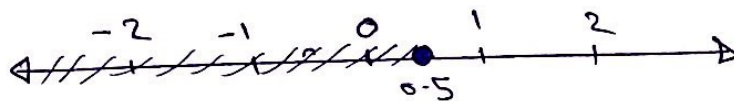
$$13x - 5 \leq 5x - 1$$

$$13x - 5x \leq -1 + 5$$

$$8x \leq 4 \quad] \div 8$$

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

$$x \leq \frac{1}{2} \Rightarrow x \leq 0.5$$



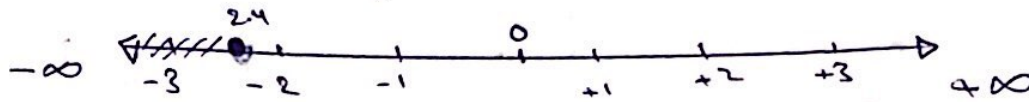
$$\text{ex 7/ } 3 + 7x \leq 2x - 9$$

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$$-2x + 7x \leq -9 - 3$$

$$5x \leq -12 \quad] : 5 \Rightarrow x \leq \frac{-12}{5}$$

$$x \leq -2.4$$



$$(-\infty, 2.4]$$



$$\text{ex 8/ } 7 \leq 2 - 5x < 9$$

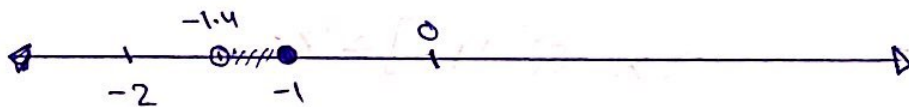
$$7 \leq 2 - 5x \cap 2 - 5x < 9$$

$$7 - 2 \leq -5x \cap -5x < 9 - 2$$

$$-5 / 5 \leq -5x \cap -5x < 7 / -5$$

$$-1 \geq x \cap x > \frac{-7}{5}$$

$$x \leq -1 \cap x > -1.4$$



$$(-1.4, -1]$$