

ABSOLUTE VALUE EQUATIONS

$$|-5| = 5 \quad \text{the distance from zero.}$$



$$|x| = 4$$

$$x = 4 \quad \text{OR} \quad x = -4$$

$$|k+6| = 9$$

↘

$$k+6 = 9 \quad k+6 = -9$$

$$x = 3 \quad \text{OR} \quad x = -15$$

$$-2|x+2| + 12 = 0$$

$$\frac{-2|x+2|}{-2} = \frac{-12}{-2}$$

$$|x+2| = 6$$

$$x+2 = 6 \quad \text{OR} \quad x+2 = -6$$

$$x = 4 \quad \text{OR} \quad x = -8$$

$$|x+7| = 3$$

No sol.

- 1) Isolate the Absolute value
- 2) Write + solve 2 equations

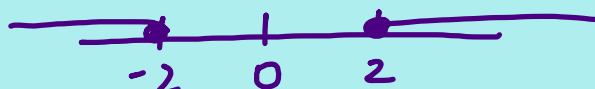
ABS. VALUE INEQUALITIES

$$|x| < 3$$



Less than AND

$$|x| \geq 2$$



GREAT OR

Abs value must
be isolated first

$$4|6x+2| + 20 > 12$$

-20 -20

$$\frac{4|6x+2|}{4} > \frac{-8}{4}$$

$$|6x+2| > -2$$

TR

$$|6x+2| < -2$$

No sol.

$$-5 |6x - 8| + 45 > -15$$

$\begin{array}{cc} -45 & -45 \end{array}$

$$\frac{-5 |6x - 8|}{-5} > \frac{-60}{-5}$$

$$|6x - 8| < 12$$

$$6x - 8 < 12 \quad \text{AND} \quad 6x - 8 > -12$$

$\begin{array}{cc} +8 & +8 \end{array}$

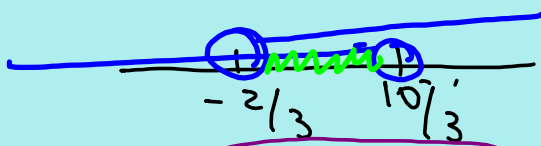
$$\frac{6x}{6} < \frac{20}{6}$$

$$x < \frac{10}{3}$$

$$\frac{6x}{6} > \frac{-4}{6}$$

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

Change \pm + direction of ineq.



$$-\frac{2}{3} < x < \frac{10}{3}$$

MATRICES

(Matrix Operations)

— a rectangular array of numbers enclosed in brackets

$$\begin{bmatrix} 2 & 3 & -4 & 0 \\ 5 & -2 & 1 & 6 \end{bmatrix}$$

↙ element ↘

Dimensions:
Rows X Cols
2 X 4

$$\begin{bmatrix} 0 & 7 \\ -6 & 3 \end{bmatrix} + \begin{bmatrix} 5 & 6 \\ 8 & -2 \\ 9 & 1 \end{bmatrix}$$

not possible

$$\begin{bmatrix} 3 & -6 \\ 4 & 2 \\ 5 & -1 \end{bmatrix} + \begin{bmatrix} 8 & 0 \\ -9 & 3 \\ 5 & 7 \end{bmatrix} = \begin{bmatrix} 11 & -6 \\ -5 & 5 \\ 10 & 6 \end{bmatrix}$$

$$3 \begin{bmatrix} 2 & 6 \\ 5 & -1 \end{bmatrix} - \begin{bmatrix} 8 & 7 \\ 9 & -2 \end{bmatrix}$$

$$\begin{bmatrix} 6 & 18 \\ 15 & -3 \end{bmatrix} + \begin{bmatrix} -8 & -7 \\ -9 & 2 \end{bmatrix}$$

$$= \begin{bmatrix} -2 & 11 \\ 6 & -1 \end{bmatrix}$$

Multiplication

$$\begin{bmatrix} 3 & -2 & 4 \\ 1 & 0 & -5 \end{bmatrix} \cdot \begin{bmatrix} 5 & 0 \\ -2 & 6 \\ -1 & 3 \end{bmatrix} = \begin{bmatrix} 15 + 4 - 4 & 0 + -12 + 12 \\ 5 + 0 + 5 & 0 + 0 + -15 \end{bmatrix}$$

$2 \times 3 \quad 3 \times 2$

$$= \begin{bmatrix} 15 & 0 \\ 10 & -15 \end{bmatrix}$$

$$2 \times (5 \cdot 5) \times 8 = 2 \times 8$$