

ABSOLUTE VALUE INEQUALITIES

$$|-5| = 5$$

$$|x| = 4$$

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

$$|k+6| = 9$$

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

$$k = 3 \quad k = -15$$

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

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

$$|x+2| = 6$$

$$x+2 = 6 \quad x+2 = -6$$

$$x = 4 \quad x = -8$$

- 1) Isolate the abs. value
- 2) Write + solve 2 equations.

$$\frac{-5|x-4|}{-5} = \frac{15}{-5}$$

$$|x-4| = -3$$

No solution

$$|x| < 3$$



$$-3 < x < 3$$

Less th AND

$$|x| \geq 2$$



Great OR

- 1) Isolate
- 2) Write 2 eq.

$$4|6x+2| + 20 > 32$$

$$\frac{4|6x+2|}{4} > \frac{12}{4}$$

$$|6x+2| > 3$$

$$6x+2 > 3$$

$$6x > 1$$

$$x > 1/6$$

OR

$$6x+2 < -3$$

$$\frac{6x}{6} < -\frac{5}{6}$$

$$x < -5/6$$

must flip sign



$$x < -5/6 \text{ OR } x > 1/6$$

$$|x+2| = -3$$

No sol

$$|x+2| > -3$$

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$$|x+2| < -3$$

No sol.

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

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

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

$$6x-8 < 12$$

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

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

AND

$$6x-8 > -12$$

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

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

overlaps



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

MATRIX ARITHMETIC

— an array of #'s enclosed between brackets

$$\begin{bmatrix} 2 & -3 & 4 & 6 \\ 8 & 2 & -5 & 0 \end{bmatrix}$$

2 x 4

Dimensions: $\begin{matrix} \# \text{ of} \\ \text{Rows} \end{matrix} \times \begin{matrix} \# \text{ of} \\ \text{columns} \end{matrix}$

+ or - = must be
same
dimensions

$$4 \begin{bmatrix} 3 & 6 \\ -2 & 5 \end{bmatrix} - \begin{bmatrix} 7 & 2 \\ -3 & 4 \end{bmatrix}$$

$$= \begin{bmatrix} 12 & 24 \\ -8 & 20 \end{bmatrix} + \begin{bmatrix} -7 & -2 \\ +3 & -4 \end{bmatrix} = \begin{bmatrix} 5 & 22 \\ -5 & 16 \end{bmatrix}$$

Multiplication

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

2×3 3×2

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

$$\begin{bmatrix} 3 & 4 & -7 \\ 5 & 6 & -3 \\ 2 & -4 & 8 \end{bmatrix} \cdot \begin{bmatrix} 7 & 3 & 8 \\ -2 & 5 & 1 \end{bmatrix} = \text{not possible}$$

3 x 3 \rightarrow 2 x 3
 not same

$$\begin{bmatrix} 2 & 6 \\ 3 & -5 \end{bmatrix} \cdot \begin{bmatrix} 1 & 3 & 5 \\ 2 & -4 & 6 \end{bmatrix} = \begin{bmatrix} 2+12 & 6+24 & 10+36 \\ 3+-10 & 9+20 & 15+-30 \end{bmatrix}$$

2 x 2 \rightarrow 2 x 3

$$\begin{bmatrix} 14 & -18 & 46 \\ -7 & 29 & -15 \end{bmatrix}$$

$$2 \times \underline{3} \cdot \underline{3} \times \underline{7} = \underline{2 \times 7}$$

$$4 \times 5 \cdot \underline{5 \times 9} = 4 \times \underline{9}$$
