Al Mahdi High Schoo	ols Mathematics	10 th -Grade
(Al-Hadath)		
(Al-Hadath) Name:	"Equations & Inequalities with absolute value"	E.S-3

> <u>Equations</u>:

Solving simple equations of the form: |ax+b| = k where $a, b \& k \in \mathbb{R}$ depuds on the sign of k

E				
	Cases	Case-1	Case-2	Case-3
Condition:	If	$\underline{k > 0}$	$\underline{k < 0}$	$\underline{k=0}$
tegies	Then: $ ax+b = k$	Is equivalent to ax+b=+k or ax+b=-k	Admits <i>no</i> solution	Admits <i>one</i> and only one solution
Expected strategies	Example	x-1 = 2 Is equivalent to x-1=2 or $x-1=-2That is, it admits two realsolutions.$	5x+3 = -4 Admits no solution.	2x-4 = 0 Is equivalent to: 2x-4 = 0 That is, it admits one unique solutions.
Graphical view		Two distinct solutions A C C C C C C C C C C C C C	Distance can never be negative	One unique solution.

TaCtiCS: Always remember to isolate the absolute value on the left side

> <u>Inequalities</u>:

Solving simple inequalities of the form: |ax+b| < k and |ax+b| > k where $a, b \& k \in \mathbb{R}$ depends on the **sign of** k

Form-1

<u>FOUTET</u>					
		Cases	Case-1	Case-2	Case-3
Cond	ition:	If	$\underline{k > 0}$	<u>k < 0</u>	$\underline{k=0}$
Expected strategies Less than	Then: $ ax+b < k$	Is equivalent to -k < ax + b < +k	Admits <i>no</i> solution	Admits <i>no</i> solution	
	Less the	Example	x-2 < 3 Is equivalent to -3 < x-2 < 3 Or we write x-2 < 3 and x-2 > -3	x-2 < -1 Admits no solution	x+1 < 0 Admits no solution
Graphical view		cal view	M Solution Set M2 A A 5	Distance can never be negative	Distance can never be negative

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<u>Form-2</u>					
		Cases	Case-1	Case-2	Case-3
Condition:		If	$\underline{k > 0}$	<u>k < 0</u>	$\underline{k=0}$
Expected strategies Greater than	nan	Then $ ax+b > k$	Is equivalent to ax+b>+k or $ax+b<-k$	Is always true	Is forever verified
	Greater tl	Expected strand	Example	x+2 > 1 Is equivalent to x+2 > 1 or $x+2 < -1$	x+2 > -1 Admits all real solution
Graphical view		cal view	Solution Set M ₁ -7 -6 -5 -4 -3 -2 -1 O ₀ 1 2 3	All solutions	

Tactics: Always remember to isolate the absolute value on the left side Tactics: Any inequality of the form:

$$|ax+b| \le k \text{ mean that:} \begin{cases} Either: |ax+b| < k \\ Or: |ax+b| = k \end{cases}$$

$$|ax+b| \ge k \text{ mean that:} \begin{cases} Either: |ax+b| > k \\ Or: |ax+b| = k \end{cases}$$

➢ <u>Special form</u>:

 $\bullet \bullet$

Solving simple equations of the form: |ax+b| = |cx+d| where $a,b,c \& d \in \mathbb{R}$ is similar to |ax+b| = k where k > 0.

Example: Solve
$$|-x+2| = |3x-5|$$

 Is equivalent to:
 $\begin{bmatrix} Either: -x+2=3x-5\\ Or: -x+2=-(3x-5) \end{bmatrix}$

 Tactics: Remember to:
 $y \neq y = 1$
 $for existance of solution.$
 $for existance of solution.$
 $for write solution set every time.$
 $for existance of solution.$

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