COLLEGE ALGEBRA

NAME: Amanda Ladd

GPS # 23 **2.8 ADDITIONAL EQUATIONS AND INEQUALITIES**

Class Time: 11:30-12:45 Date:

Useful Guidelines:

* To solve absolute value equations and inequalities:

1) $|ax+b|=k$: solve the compound equation $ax+b=k$ or $ax+b=-k$

2) $|ax+b|>k$: solve the compound inequality $ax+b>k$ or $ax+b<-k$

3) $|ax+b|<k$: solve the compound inequality $-k<ax+b<k$

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Solve the following absolute value equations and inequalities. Give the solution set in set notation for equations and in interval notation for inequalities. Graph the solution set.

1. a) $|4x+2|=18$

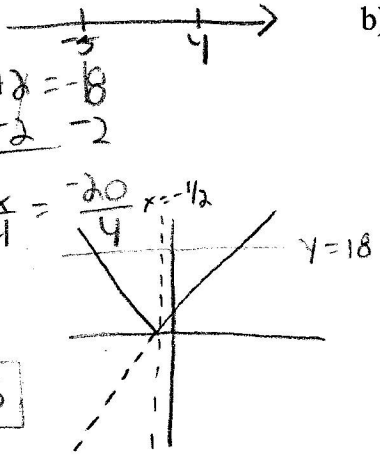
$4x+2=18$ or $4x+2=-18$

$-2 \quad -2$ $\quad$ $-2 \quad -2$

$\frac{4x}{4}=\frac{16}{4}$ $\quad$ $\frac{4x}{4}=\frac{-20}{4}$

$x=4$ or $x=-5$

sol set: $\{x \mid x=-5,4\}$



b) $|3x+3|+6=15$

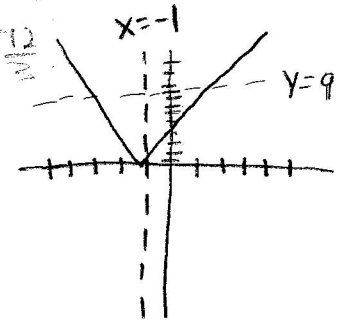
$3x+3=9$ $\quad$ $3x+3=-9$

$-3 \quad -3$ $\quad$ $-3 \quad -3$

$\frac{3x}{3}=\frac{6}{3}$ $\quad$ $\frac{3x}{3}=\frac{-12}{3}$

$x=2$ or $x=-4$

sol set: $\{x \mid x=-4,2\}$

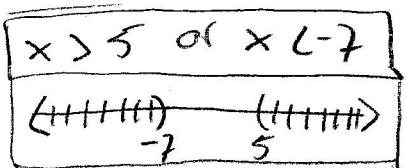


2. a) $|x+1|>6$

$x+1>6$ $\quad$ $x+1<-6$

$-1 \quad -1$ $\quad$ $-1 \quad -1$

$x>5$ or $x<-7$



sol set: $\{x \mid x<-7 \text{ or } x>5\}$

Int not: $(-\infty,-7)\cup(5,\infty)$

b) $|3-y|+3\geq 6$

$-3 \quad -3$

$3-y\geq 3$ $\quad$ $3-y\leq -3$

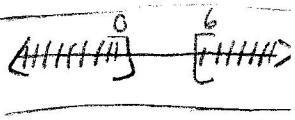
$-3 \quad -3$ $\quad$ $-3 \quad -3$

$\frac{-y}{-1}\geq\frac{0}{-1}$ $\quad$ $\frac{-y}{-1}\leq\frac{-6}{-1}$

$y\leq 0$ or $y\geq 6$

Int not: $(-\infty,0]\cup[6,\infty)$

sol set: $\{y \mid y\geq 6 \text{ or } y\leq 0\}$



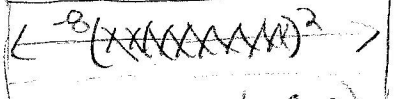
3. a) $|2x+6|<10$

$2x+6<10$ $\quad$ $2x+6>-10$

$-6 \quad -6$ $\quad$ $-6 \quad -6$

$\frac{2x}{2}<\frac{4}{2}$ $\quad$ $\frac{2x}{2}>\frac{-16}{2}$

$x<2$ and $x>-8$



Int not: $(-8,2)$

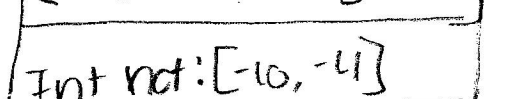
sol set: $\{x \mid -8<x<2\}$

b) $|x+7|\leq 3$

$x+7\leq 3$ $\quad$ $x+7\geq -3$

$-7 \quad -7$ $\quad$ $-7 \quad -7$

$x\leq -4$ and $x\geq -10$



Int not: $[-10,-4]$

sol set: $\{x \mid -10\geq x\leq -4\}$