Algebra III
Chapter 3 Note Packet

Name KEY

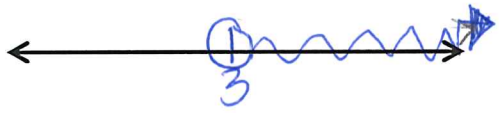
Section 3.1: Linear Inequalities and Absolute Value Inequalities

Essential Question:
How do you graph a linear inequality and an absolute value inequality?

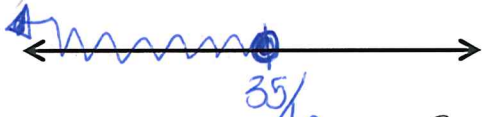
Solve and graph the following inequalities.

*Solve like a linear equation → Isolate the variable

1) $6x - 10 > 8$
$+10 \quad +10$
$\frac{6x}{6} > \frac{18}{6}$
open dot
$x > 3$



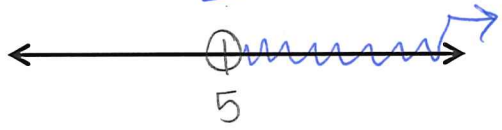
2) $\frac{6x-3}{4} \leq (8)(4)$
$6x - 3 \leq 32$
$+3 \quad +3$
$\frac{6x}{6} \leq \frac{35}{6}$
closed dot
$x \leq \frac{35}{6}$
≈ 5.3



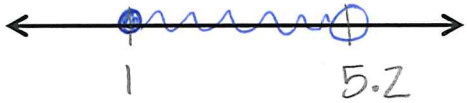
Graph the following inequalities.

*write variable 1st

3) $5 < m$
$m > 5$



4) $1 \leq x < 5.2$
closed open
{< > open ≤ ≥ closed}
* x in middle → shade middle



Absolute Value Inequalities *Distance from zero → never negative!

$>$ $\geq$ great "OR" than

Ex: $|x| > m$ is rewritten as: $x > m$ **OR** $x < -m$

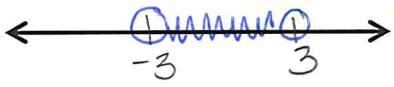
$<$ $\leq$ less th"AND"

Ex: $|x| < m$ is rewritten as: $x < m$ **AND** $x > -m$

*shade only the intersection → always write final "and" statement as one piece with variable in middle

Graph the following absolute value inequalities: → 2 pieces!

5) $|x| < 3$

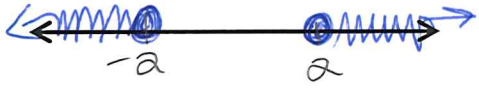


$x < 3$ and $x > -3$

$-3 < x < 3$

"AND" statements → final is one piece

6) $|m| \geq 2$



$m \geq 2$ OR $m \leq -2$

"OR" statements are left as 2 pieces

Graph the following absolute value inequalities:

Equals is "or" Statement

7) Solve and graph $|x - 2| < 3$

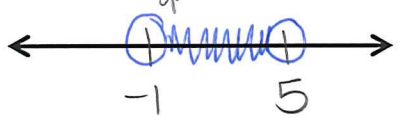
$x - 2 < 3$ AND $x - 2 > -3$

$+2 \quad +2 \qquad +2 \quad +2$

$x < 5$ and $x > -1$

smaller # → $-1 < x < 5$ ← larger #

open

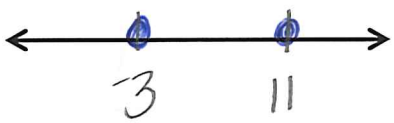


8) Solve and graph $|x - 4| = 7$

$x - 4 = 7$ OR $x - 4 = -7$

$+4 \quad +4 \qquad +4 \quad +4$

$x = 11$ OR $x = -3$



Section 3.1 Summary:

To graph a linear inequality isolate the variable on the left. If the symbol is $<$ or $>$ place an open circle on the x-value on a number line (closed circle for $\geq$ or $\leq$).

If less than (or equal to) shade left, if greater than (or equal to) shade right.

Absolute Value

Write two pieces then solve both linear inequalities.

open	closed	shade
$>$	$\geq$	Right
$<$	$\leq$	Left