Name _____

2.6 Notetaking with Vocabulary

_____ Date _____

***Learning target*: Understand solving liner inequalities.**

Success criteria: I can solve absolute value inequalities.

Write the meaning of each vocabulary term.

absolute value inequality - an inequality that contains an absolute value expression.

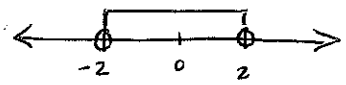
absolute deviation - used in modeling - the absolute value of the ideal/axis. difference of x and a given value.

already did this

absolute deviation = |x - given value|

error distance

Notes: |x| < 2 means the distance b/t x and 0 is less than 2

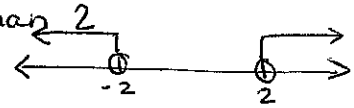


the graph of this is -2 < x < 2

looks like an "and"

|x| = 2 means the distance b/t x and 0 is 2.

|x| > 2 means the distance between x and 0 is greater than 2



looks like an "or"

the graph of this is the graph of x < -2 or x > 2

Core Concepts

Solving Absolute Value Inequalities

To solve $|ax + b| < c$ for $c > 0$, solve the compound inequality

less than is and

$ax + b > -c$ *and* $ax + b < c$.

To solve $|ax + b| > c$ for $c > 0$, solve the compound inequality

greater "or" than is or

$ax + b < -c$ *or* $ax + b > c$.

In the inequalities above, you can replace $<$ with $\leq$ and $>$ with $\geq$.

Notes:

Name _____ Date _____

2.6 Notetaking with Vocabulary (continued)

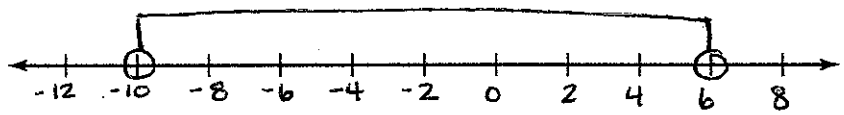
Practice

In Exercises 1–9, solve the inequality. Graph the solution, if possible.

1. $|y + 2| < 8$ (distance less than 8 → and)

$y+2 < 8$ and $y+2 > -8$
$-2 \quad -2 \qquad -2 \quad -2$

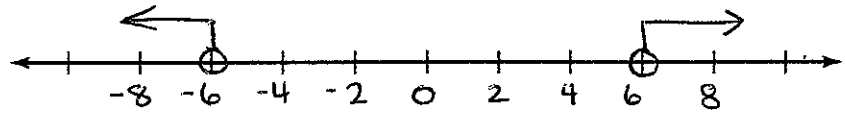
$y < 6$ and $y > -10$



2. $\left|\frac{q}{3}\right| > 2$ (distance greater than 2 → or)

$\frac{q}{3} > 2$ or $\frac{q}{3} < -2$

$q > 6$ or $q < -6$



3. $3|2a + 5| + 10 \leq 37$
$\quad -10 \quad -10$

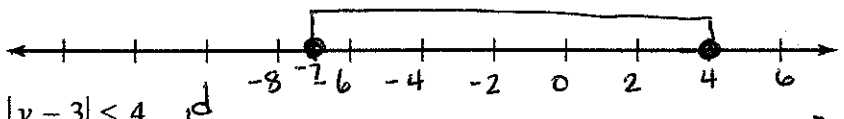
$\frac{3|2a+5|}{3} \leq \frac{27}{3}$

$|2a+5| \leq 9$ distance less than 9 "and"

$2a + 5 \leq 9$ and $2a + 5 \geq -9$
$\quad -5 \quad -5 \qquad\qquad -5 \quad -5$

$\frac{2a}{2} \leq \frac{4}{2} \qquad \frac{2a}{2} \geq \frac{-14}{2}$

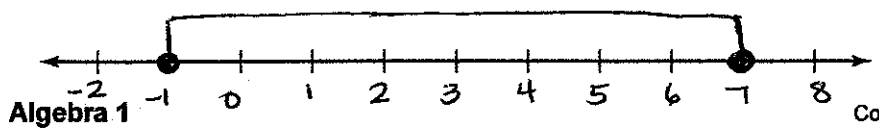
$a \leq 4$ and $a \geq -7$



4. $|y - 3| \leq 4$ distance less than 4

$y - 3 \leq 4$ and $y - 3 \geq -4$
$\quad +3 \quad +3 \qquad\qquad +3 \quad +3$

$y \leq 7$ and $y \geq -1$



5. $|3 + r| - 4 < 0$

$+4 \quad +4$

$|3+r| < 4$

and

$3 + r < 4$ and $3 + r > -4$

$r < 1$ and $r > -1$

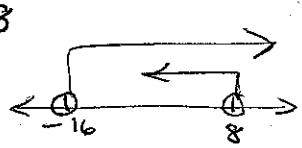
6. $|f + 12| > -4$

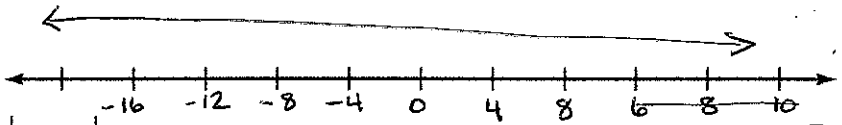
"or"

can just look – won't $|f+12|$ be $\geq$ zero so they know above is true. All real numbers are solutions.

$f + 12 > -4$ or $f + 12 < +4$

$f > -16$ or $f < 8$





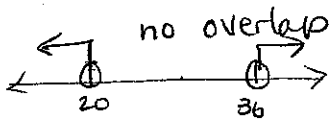
7. $\left|\frac{x}{4} - 7\right| < -2$ → also – look → Is this possible?

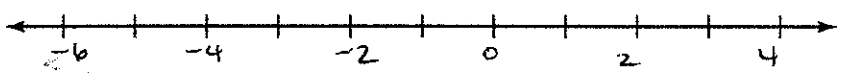
$\frac{x}{4} - 7 < -2$ and $\frac{x}{4} - 7 > 2$

$\frac{x}{4} < 5$ and $\frac{x}{4} > 9$

$x < 20$ and $x > 36$

No solution





8. $|4x - 7| + 8 \geq 17$

$-8 \quad -8$

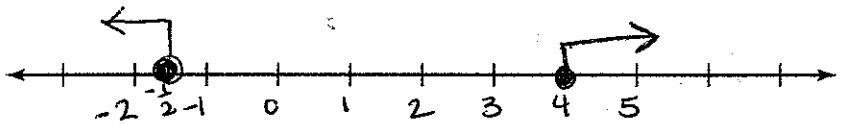
$|4x - 7| \geq 9$

$4x - 7 \geq 9$ or $4x - 7 \leq -9$

$4x \geq 16$ $\quad 4x \leq -2$

$x \geq 4$ or $x \leq -\frac{2}{4}$

$x \leq -\frac{1}{2}$



9. $6|3 - k| + 14 > 14$

$-14 \quad -14$

$\frac{6|3-k|}{6} > \frac{0}{6}$

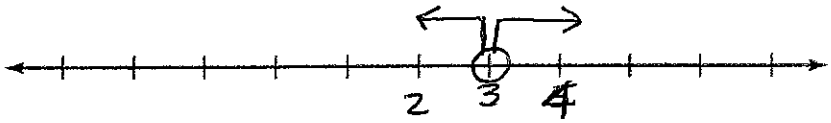
$|3-k| > 0$

$3-k > 0$ or $3-k < 0$

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

$\frac{-k}{-1} > \frac{-3}{-1}$ or $\frac{-k}{-1} < \frac{-3}{-1}$

$k < 3$ or $k > 3$



10. At a certain company, the average starting salary s for a new worker is \$25,000. The actual salary has an absolute deviation of at most \$1800. Write and solve an inequality to find the range of the starting salaries.

equation - ok

ab. dev = $|x - \text{given value}|$

$1800 = |x - 25{,}000|$

$x - 25{,}000 = 1800$

$+25{,}000 \quad +25{,}000$

$x = 26{,}800$

$x - 25{,}000 = -1800$

$+25{,}000 \quad +25{,}000$

$x = 23{,}200$

Starting salaries range from \$23,200 to \$26,800.