Notes U1A L9 Absolute Value Equations. Name: _____ Hr: _____

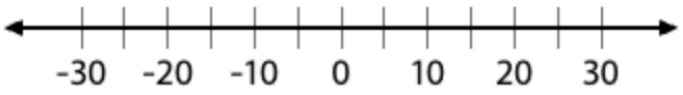
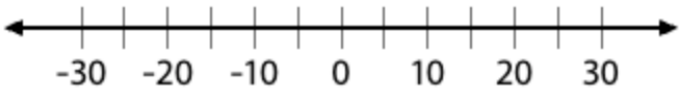
Target Skills Find distance between two positions using absolute value. Solve absolute value equations by considering both possible values inside the bars. Explain when there are two, one, or no solutions.

Review Solve each equation

1. $3x - 7 = -4x + 14$	2. $-2(x + 3) - 2 = 10$	3. $5 - x = -9$

Part 1 MathBoard distance demonstrations

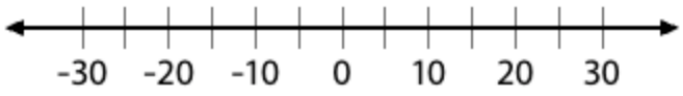
Record the two positions shown. Subtract in either order, then use absolute value to find the distance.

Demonstration 1 Two cars Position A: _____ Position B: _____  Distance calculation: Distance: _____ units	Demonstration 2 Two cars Position A: _____ Position B: _____  Distance calculation: Distance: _____ units
Demonstration 3 Two points Position A: _____ Position B: _____  Distance calculation: Distance: _____ units	Demonstration 4 Two points Position A: _____ Position B: _____  Distance calculation: Distance: _____ units

Distance is a POSITIVE VALUE.

ABSOLUTE VALUE (| |): Is used to indicate I want the POSITIVE VALUE of what is inside the absolute value.

Absolute value: Is used for distance, since distance is always positive.



$\lvert 17 \rvert$ = _____	$\lvert -23 \rvert$ = _____	$\lvert 0 \rvert$ = _____	$\lvert 5 - 9 \rvert$ = _____

Part 2 Solve an absolute value equation

Example 1 |x − 7| = 24

What two values inside the bars have an absolute value of 24? _____ and _____

Case 1:	

Interpret the answers: Both _____ and _____ are 24 units from 7.

The IMPOSSIBLE:

$|expression| =$ a negative number

Steps to solve ABSOLUTE VALUE EQUATIONS

1. Put the absolute value on the left and isolate it.
2. Set the inside equal to the right side and its opposite.
3. Solve both cases.
4. Check each answer in the original equation.

Example 2: |2x − 3| = 4	Example 3: 2|x − 8| + 3 = 15
Example 4: |3x − 5| = 5x A solution from either case may fail the original equation when the right side contains x resulting in an **Extraneous Solution.**	Example 5: x = |2x − 3|

Special Cases

|x + 6| = 0	|x − 8| = −2
Exit Ticket: Solve: $\|x - 8\| = 18$	