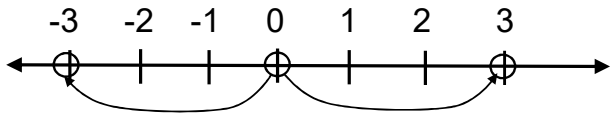
Math -2: Lesson 1-5 HANDOUT (Absolute Value)

$|x| = 3$ Means: "what numbers are a distance of _____ from zero on the number line?"



$|x| = 3$ → $|3| = 3$ $|-3| = 3$ → $x = 3, -3$

$|x| = -5$ Means: "what numbers are a distance of _____units from zero on the number line?"

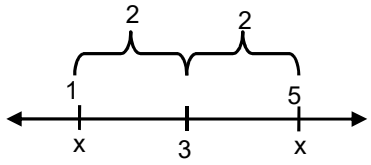
Has _____.

$|x - 3| = 2$ (English): What numbers are exactly 2 units from the center number "3"?

$x = 3 \pm 2$

$x = 1, 5$

$|x - (+3)| = 2$



x = 3 - 2
x = 1

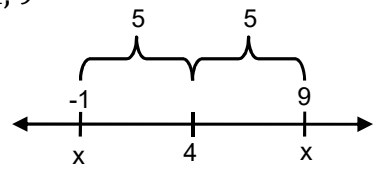
x = 3 + 2
x = 5

$|x - 4| = 5$ (English): What numbers are exactly 5 units from the center number "4"?

$x = 4 \pm 5$

$x = -1, 9$

$|x - (+4)| = 5$



x = 4 - 5
x = -1

x = 4 + 5
x = 9

Solve the equations. Draw a picture if necessary.

$|x + 1| = 3$

$|x - 4| = 5$

$|x - 5| = 1$

Another way to think about it

$|-1| = 1$ $\quad$ $|+1| = 1$

$|x-5| = 1$ $\quad$ $|x-5| = 1$

$x - 5 = -1$ $\quad$ $x - 5 = 1$

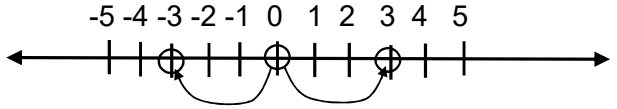
$x = 4$ $\quad$ $x = 6$

For some problems, this is a better way to think about it.

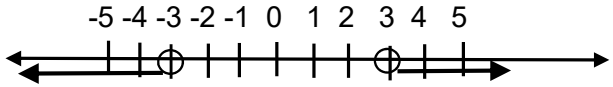
Solve $|2x-1| = 5$

$|x| > 3$ What numbers are _____away from zero on the number line?

Find the numbers that are _____from zero.



Shade all the numbers that are _____from 0 than -3 and +3

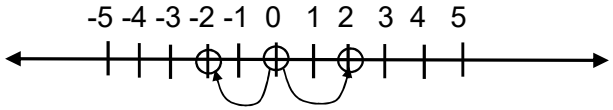


$|x| > 3 \rightarrow \quad x < -3 \;\; OR \;\; x > 3$

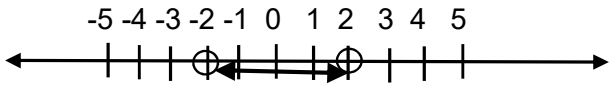
$x = (-\infty, -3) \cup (3, \infty)$

What numbers are less than 2 units away from zero on the number line?

Find the numbers that are exactly 2 way from zero.



Shade all the numbers that are closer to 0 than -2 and +2



$|x| < 2 \rightarrow \quad x > -2 \;\; AND \;\; x < 2$

$-2 < x < 2$

$x = (-2, 2)$

Solve the Inequality. Write the solution as:

a) Compound inequality
b) Interval notation
c) graph

$|x - 5| > 1$

$|x + 4| < 6$

$|2x - 3| < 7$