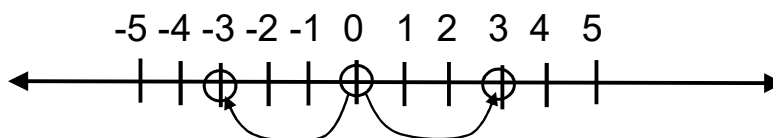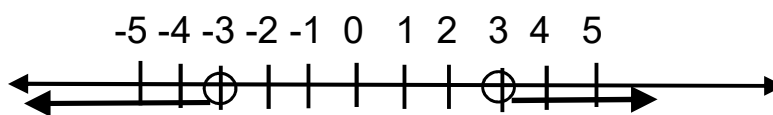## Math -2: Lesson 1-7 (Absolute Value Inequalities)

$|x| > 3$ What numbers are greater than 3 units away
from zero on the number line?

Find the numbers that are exactly 3 way from zero.

-5 -4 -3 -2 -1 0   1 2   3 4   5

Shade all the numbers that are further away from 0 than -3 and +3

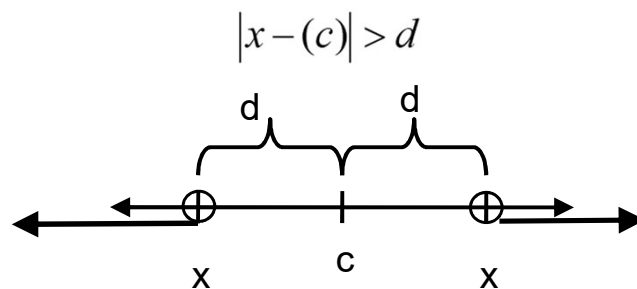-5 -4 -3 -2 -1 0   1 2   3 4   5

$|x| > 3$ → $x < -3$ OR $x > 3$

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

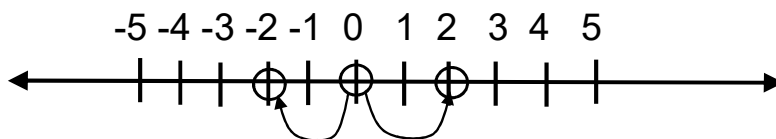
Absolute Value: $|x - c| > d$

"What numbers are greater than "d" units away from the
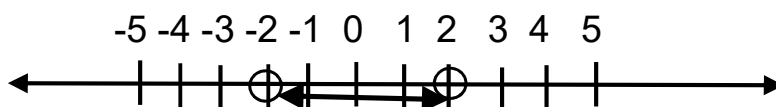center number "c" on the number line?

$$|x - (c)| > d$$

d   d

x   c   x

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

Find the numbers that are exactly 2 way from zero.

-5 -4 -3 -2 -1 0 1 2 3 4 5

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

-5 -4 -3 -2 -1 0 1 2 3 4 5

$$|x| < 2 \quad \rightarrow \quad x > -2 \ AND \ x < 2$$
$$-2 < x < 2$$
$$x = (-2, 2)$$

$$|x - (-4)| > 6$$ The center number is '-4'.

The distance is 6.

x = -4 − 6   x = −4 + 6
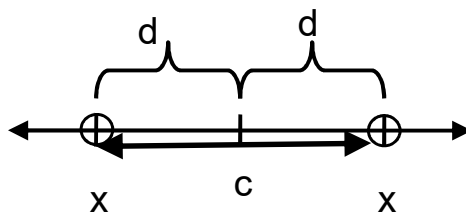   x = -10   x = 2

The boundary numbers are -10 and 2.

The solution are the numbers that are further away from 5 than the boundary numbers.

x > -10 and x < 2

Absolute Value: $|x - c| < d$

"What numbers are less than "d" units away from the center number "c" on the number line?

"c" is the "center number" and the distance from 'c' is <u>less than</u> "d" units

Solve the Inequality. Write the solution as:
a) Compound inequality
b) Interval notation
c) graph

$|x - 5| > 1$

$|x + 4| < 6$

$|2x - 3| < 7$