

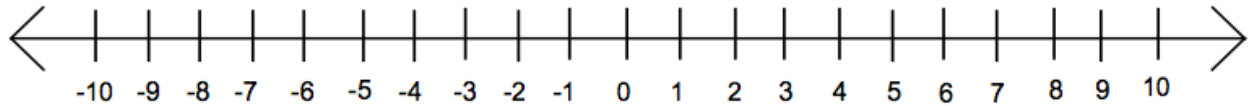
## Math 4. Classwork 13.



### Absolute value of a number.

Mark the points A(0), B(1), C(-1), D(5), E(-5)

Is there anything in common between points F and G, D and E? *How far from zero is each number?*



$|8| =$

$|-8| =$

$|24| =$

$|-24| =$

### Does a fraction have an absolute value?

$\left|\frac{1}{4}\right| =$

$\left|-\frac{1}{4}\right| =$

To solve an equation means to find all values which will give us a true statement when put into the equation instead of a variable. Can we solve the following equation? How many solutions does it have?

$|x| = 5$

$|x| = 3$

$|y| = 10$

$|z| = -2$

### Select all numbers that have an absolute value of 12

$a - \frac{1}{2}$

$b. 1.2$

$c. -12$

$d. 12$

### How would you compare these two numbers?

$-6 \quad +3$

$|-6| \quad |3|$

$17 \quad -25$

$|17| \quad |-25|$

Compare ( $>$ ,  $<$ , or  $=$ ), if possible, if  $a$  and  $b$  are positive numbers and  $x$  and  $y$  are negative numbers:

$0 \dots x$

$a \dots 0$

$-b \dots 0$

$0 \dots -x$

$a \dots x$

$y \dots b$

$-y \dots x$

$-a \dots b$

$|x| \dots x$

$-|y| \dots y$

$a \dots |a|$

$|b| \dots |-b|$

$|x| \dots a$

$|x| \dots -x$

$|x| \dots -|y|$

$a \dots |-b|$

## Subtract Either Way Around

It doesn't matter which way around we do a subtraction, the absolute value will always be the same:

$$|7-3| = 4 \quad (7-3 = 4)$$

$$|3-7| = 4 \quad (3-7 = -4, \text{ and } |-4| = 4)$$

Solve equations:

$$\begin{array}{ccc} & |x - 15| = 5 \text{ since } |5| = |-5| = 5, \text{ then:} & \\ & \swarrow \quad \quad \quad \searrow & \\ x - 15 = 5 & \text{or} & x - 15 = -5 \\ x = 5 + 15 = 20 & & x = -5 + 15 = 10 \\ & & x = 20, 10 \end{array}$$

$$|3(x - 5)| = 21$$

$$|8x - 10| = 6$$

$$|2x| = 42$$

Simplify the following expressions:

a)  $m - (n + m) =$

b)  $-(n - x) - x =$

c)  $p + (-m + k - p) =$

d)  $-a - (m - a + p) =$

e)  $-(m - a) - (k + a) =$

f)  $m + (k - a - m) =$

g)  $m - (a + m) - (-a - m) =$

h)  $a - (a - b) =$

**Simplify the following expressions:**

a)  $2a + 3(a + b) - 3b =$

b)  $5(m - 3n) + 14n =$

c)  $10b - (c - b) + c =$

**Factorize the following expressions:**

a)  $\frac{1}{3}a - \frac{1}{3}b =$

b)  $10 + 15 =$

c)  $5a - 3a =$

**Solve the following equations:**

$$\frac{1}{3}x + 12 = x$$

$$6x - 14 = -5x - 3$$

A swimming pool can be filled by one pipe in 5 hours, by another pipe in 10 hours and by a third pipe in 15 hours. How long it will take to fill up the pool if all three pipes are working?

A swimming pool can be filled with one pipe in 15 hours. Full pool can be drained out with another pipe in 30 hours. How long it will take to fill up the pool with opened drain pipe?