

Name _____ Period Key

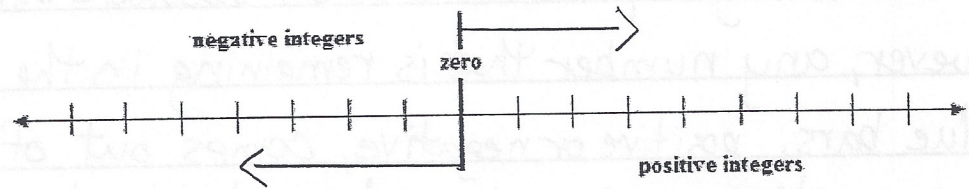
(accel)

So, absolute value gives a positive answer.

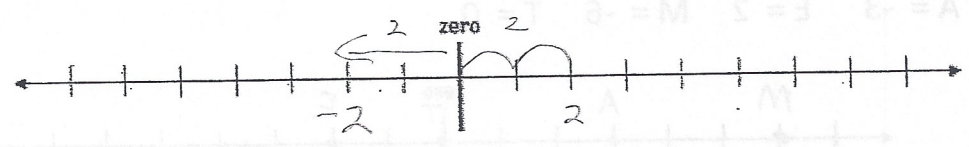


NOTES: Absolute Value - How far is a number from zero?

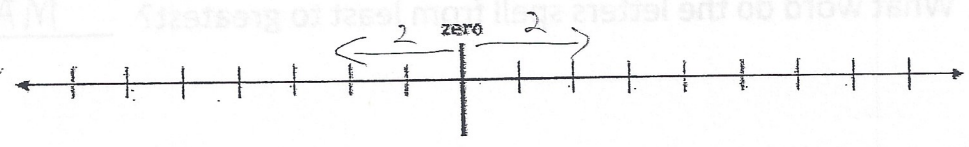
- -The absolute value of a number is its distance from zero on a number line.
- The absolute value of a number is always a positive number (unless the number is 0).
- -The absolute value of a number a is written as $|a|$. This is read, "the absolute value of a ."
- $|a|$ means take the absolute value of the number inside the symbols. Parentheses () are not the same as absolute value bars. $(-a) \neq |-a|$



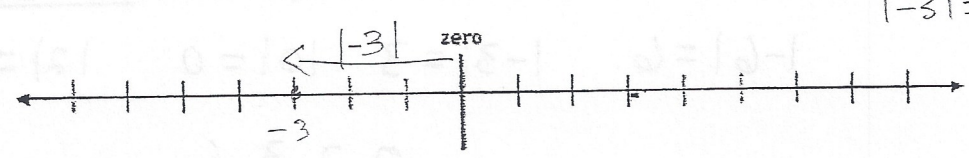
1) On the number line below, name 2 integers that are the same distance from zero. 2 -2



2) Graph the absolute value of 2 on the number line.



3) Graph the absolute value of -3 on the number line.



4) Which expression does not belong with the other three?

$|6|$ 6 -6 $|-6|$

5) Is the following statement true or false? False

$|6| = -6$

6) Simplify the expressions.

$(34) = \underline{34}$ $|34| = \underline{34}$

$(-4) = \underline{-4}$ $|-4| = \underline{-4}$

$-(15) = \underline{-15}$ $-|-15| = \underline{-15}$

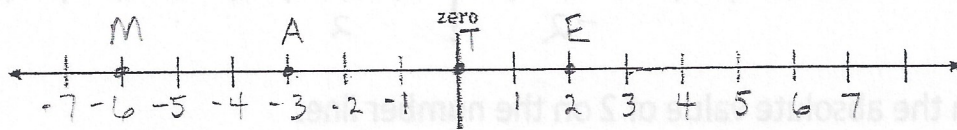
negative sign inside the absolute value bars = positive number outside the absolute value bars. $| -7 | = 7$

Explain the difference between parentheses and absolute value bars.

parentheses group numbers as do absolute value bars.
However, any number that is remaining in the absolute value bars, positive or negative, comes out of the bars as a positive. example: $|5 - 8| = |-3| = 3$

7) a) Graph and label the following points on the number line:

$A = -3$ $E = 2$ $M = -6$ $T = 0$



What word do the letters spell from least to greatest? MATE

b) Find the absolute value of each point in part a. When placed in order from least to greatest, what word do the letters spell now? TEAM

$|-6| = 6$ $|-3| = 3$ $|0| = 0$ $|2| = 2$

0, 2, 3, 6
T E A M

8) True or false?

a) The absolute value of every integer is positive.

False

Zero is neither positive nor negative

* b) If $x < 0$, then $|x| = -x$

True

Substitute: If $-3 < 0$ then $| -(-3) | = 3 = -(-3)$

If a number x is negative, then its absolute value is its opposite, $-x$

9) Order from least to greatest:

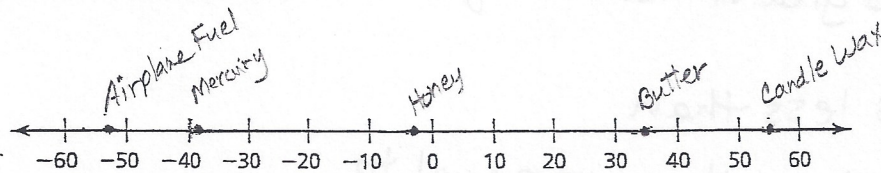
-12 $|-26|$ -15 $|-12|$ $|10|$ $-15, -12, 10, 12, 26$
 \downarrow \downarrow \downarrow \downarrow \downarrow
 -12 26 -15 12 10

10) The freezing point is the temperature at which a liquid becomes a solid.

Substance	Freezing Point (°C)
Butter	35
Airplane fuel	-53
Honey	-3
Mercury	-39
Candle wax	55

a) Which substance in the table has the lowest freezing point? Airplane fuel

b) Graph each freezing point.



c) Is the freezing point of mercury or butter closer to the freezing point of water, 0°C ? Explain. Butter is closer to the freezing point of water. It is 35 degrees away from 0° while mercury is 39 degrees away.

d) Is the freezing point of airplane fuel or candle wax closer to the freezing point of water? Explain. Airplane fuel is -53° which is 53° away from zero while candle wax is 55° degrees away from zero.

11) Complete the statements using $<$, $>$, or $=$.

$$\begin{array}{l} | -4 | \quad < \quad 7 \\ \downarrow \\ 4 \end{array} \quad \begin{array}{l} | -4 | \quad > \quad -6 \\ \downarrow \\ 4 \end{array}$$

$$\begin{array}{l} -5 \quad < \quad | -9 | \\ \downarrow \\ 5 \end{array} \quad \begin{array}{l} | 5 | \quad = \quad | -5 | \\ \downarrow \\ 5 \end{array}$$

12) Determine whether $n \geq 0$ or $n \leq 0$.

$$n + |-n| = 2n \quad \underline{n \geq 0}$$

$$n + |-n| = 0 \quad \underline{n \leq 0}$$

Substitute: 3, -3

$$\begin{array}{l} \geq \\ 3 + |-3| = 2(3) \\ 3 + 3 = 6 \\ \text{True} \end{array} \quad \begin{array}{l} \leq \\ (-3) + | -(-3) | = 2(-3) \\ -3 + 3 \neq -6 \\ \text{False} \end{array}$$

Substitute: 3, -3

$$\begin{array}{l} \geq \\ 3 + |-3| = 0 \\ 3 + 3 \neq 0 \\ \text{False} \end{array} \quad \begin{array}{l} \leq \\ (-3) + | -(-3) | = 0 \\ -3 + 3 = 0 \\ \text{True} \end{array}$$

Thoughts and examples of absolute value.

$>$ means greater than

\geq means greater than or equal to

$<$ means less than

\leq means less than or equal to

\neq means does not equal

$$(-x) = -x \quad -(x) = -x \quad -(-x) = x$$

$$|-x| = x \quad -|x| = -x \quad -|-x| = -x$$