Pre-Calculus 11
Chapter 7: Absolute Value and Reciprocal Functions

7.1 Absolute Value

Absolute value: For a real number, a, the absolute value is written as $|a|$.

Essentially, to take the absolute value of a number means to ask how far away it is from zero.

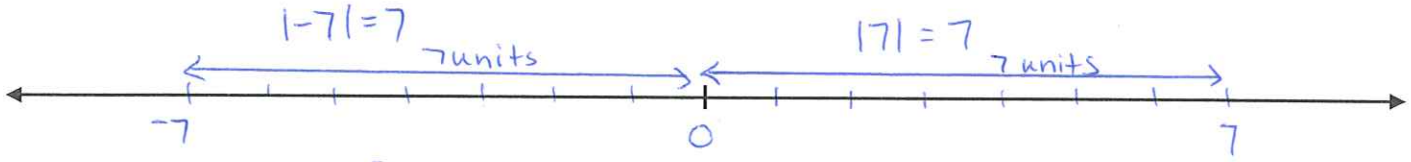
- The absolute value of a positive number is always positive.

  $|7|=7$

- The absolute value of a negative number is always positive.

  $|-7|=7$

- The absolute value of zero is zero. $|0|=0$



In general: $|n|=\begin{cases} n, & \text{if } n \geq 0 \\ -n, & \text{if } n<0 \end{cases}$ ← this is called a piecewise function

Think: $|5|=5$ and $|-5|=-(-5)=5$

Example: Evaluate each expression.

a) $|-12|$

$=12$

b) $|-4|-|-3|$

$=4-3$

$=1$

c) $5-3|2-7|$ ← treat it like brackets.

$=5-3|-5|$

$=5-3(5)$

$=5-15$

$=-10$

d) $|12(-3)+5^2|$

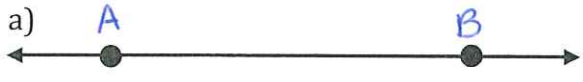
$=|-36+25|$

$=|-11|$

$=11$

Example: Write two different absolute value expressions to represent the distance between points A and B.

a)



$|13-4|$ OR $|4-13|$

$=|9|$ $=|-9|$

$=9$ $=9$

b)

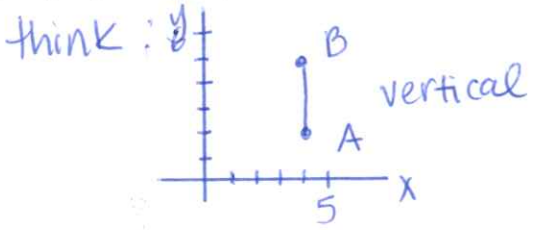
$|7-(-5)|$ OR $|-5-7|$

$=|12|$ $=|-12|$

$=12$ $=12$

Example: Use absolute value symbols to write an expression for the length of each horizontal or vertical line segment.

a) A(4,2) to B(4,5)

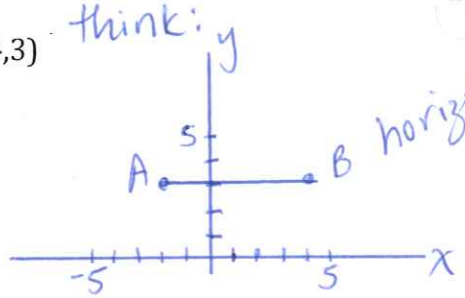
think: 

vertical

$|5-2| = 3$

b) A(−2,3) and B(4,3)

$|-2-4| = 6$

think: 

horizontal

Graphing Review

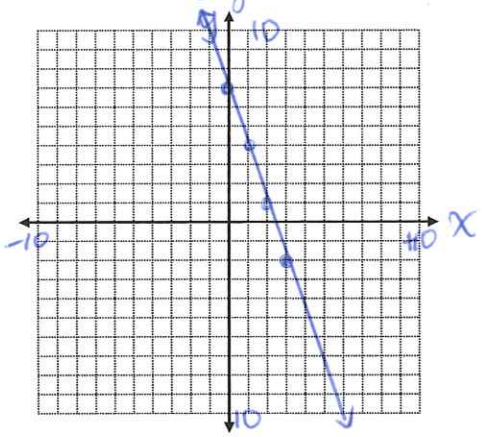
We will need to use our knowledge of graphing linear and quadratic functions in this unit.

Example: Graph each function. Clearly label axes and scale.

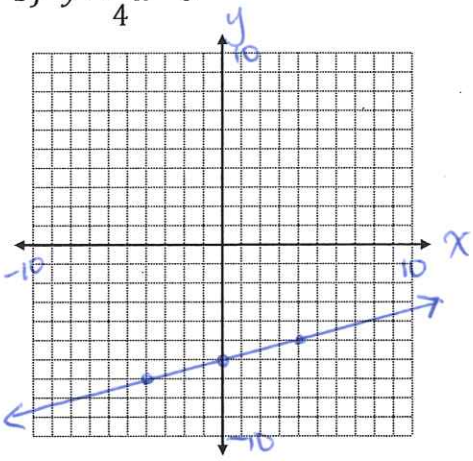
a) $y = -3x + 7$

slope, y-int

math 10

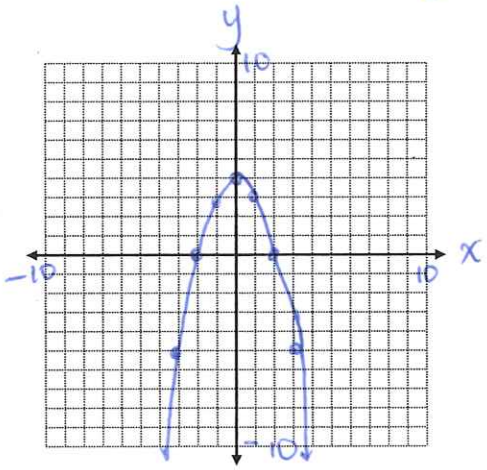


b) $y = \frac{1}{4}x - 6$



c) $y = -x^2 + 4$

earlier this year!



d) $y = (x-5)^2 + 1$

vertex: (5, 1)