***Chapter 7 – Absolute Value and Reciprocal Functions (PC11)***

***7.1 – Absolute Value***

Absolute value of a number is a distance, since distance is always positive the absolute value is always positive. Ex. |-3| = 3 or |3| = 3 . Both of these have a distance of 3.

Examples:

1. Write the real numbers in order from the least to greatest:

|3.5|, -2, |-5.75|, 1.05, |, |-0.5|, -1.25, |

1. Evaluate the following:
   1. |-4| - |-3|
   2. |-12 + 8|
   3. |12(-3) + 52|
2. Wesley volunteers at a local hospital because he is interested in a career in health care. One day, he takes the elevator from the first floor up to the sixth floor to see his supervising nurse. His list of tasks for that day sends him down to the second floor to work in the gift shop, up to the fourth floor to visit with patients, and down to the first floor to greet visitors and patients. What is the total change in floors for Wesley that day?

14 floors

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7.2 – Absolute Value Functions

Absolute value function – a function that involves the absolute value. Will be y =

Piecewise function – a function that is made of two or more separate functions with its own domain.

Ex. |x| can be defined as:

Y = x, if x > 0 or –x if x<0

Examples:

1. Consider the absolute value function of y = |3x +1|
   1. Determine the y-intercept and the x-intercept.
   2. Sketch the graph.
   3. State the domain and range.
   4. Express as a piecewise function.
2. Consider the absolute value function f(x) = |x2 – x – 2|
   1. Determine the y-intercept and the x-intercepts
   2. Sketch the graph
   3. State the domain and range.
   4. Express as a piecewise function.

7.3 – Absolute Value Equations

Absolute value equation – an equation involving absolute values

Steps solving algebraically:

1. Get the absolute value by itself
2. Split up the + and – values for the absolute value
3. Solve both equations from step 2.

Graphically to a table of values.

Examples:

1. Solve |6 – x| = 2 graphically and algebraically.
2. Solve |x+5| = 4x – 1
3. Solve |4x-5| + 9 = 2
4. Solve |x2 – 3x| = 2
5. Solve |x – 5| = x2 – 8x + 15