



## Appendix 2: Solutions

### Lesson 6.1: Absolute Value and Absolute Value Functions



#### Practice Solutions – I

1. Explain how  $|a|$  can be used to represent the distance from  $a$  to zero on a number line.

If  $a$  is positive, it is  $a$  units above zero. If  $a$  is negative it is  $a$  units below zero. In both cases, the absolute value can be used to indicate the magnitude of the difference. So in both cases, the distance between  $a$  and zero is  $|a|$ .

2. Evaluate each of the following

a.  $|17|$

$$17$$

b.  $3|22 - 54| + 12$

$$\begin{aligned} 3|22 - 54| + 12 &= 3|-32| + 12 \\ &= 3(32) + 12 \\ &= 108 \end{aligned}$$

c.  $4|1 - 7| - 3|8 - 6|$

$$\begin{aligned} 4|1 - 7| - 3|8 - 6| &= 4|-6| - 3|2| \\ &= 4(6) - 3(2) \\ &= 18 \end{aligned}$$

d.  $|-6 + 12| + |3 - (-7)| - |8 - 15^2| + |-6|$

$$\begin{aligned} |-6 + 12| + |3 - (-7)| - |8 - 15^2| + |-6| &= |6| + |10| - |-217| + |-6| \\ &= 6 + 10 - 217 + 6 \\ &= -195 \end{aligned}$$

3. The inequality  $|a - b| < c < a + b$  is called the triangle inequality, where  $a$ ,  $b$ , and  $c$  are the side lengths of a triangle. Explain the restrictions on a triangle represented by the triangle inequality.

The inequality  $|a - b| < c$  means that the difference between two sides of the triangle cannot be greater than the length of the third side. The inequality  $c < a + b$  means the sum of two sides cannot be greater than the length of the third side.



## Practice Solutions – II

1. Complete the following table of values.

$x$	$f(x)$	$ f(x) $
-5	20.5	20.5
-4	14	14
-3	8.5	8.5
-2	4	4
-1	0.5	0.5
0	-2	2
1	-3.5	3.5
2	-4	4
3	-3.5	3.5
4	-2	2
5	0.5	0.5