Absolute Value Function

RaiseMyMarks.com

2020

The absolute value function

The aboslute value function is a special function that takes the sign away from the value. For example, if we consider the following numbers,

$$-1, 2, -10, 56, -3, -2.1$$

the sign of each function is, respectively,

$$-, +, -, +, +, -, -$$

The **absolute value function** removes the signs and leaves the "value". So we have from the list above,

$$1, 2, 10, 5, 6, 3, 2.1$$

after the absolute value function is applied to each number. Formally, the absolute value function is writte and defined as,

$$f(x) = |x| = \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0 \end{cases}$$

For a specific function $g(x)$ the absolute function of $g(x)$ is,

$$|g(x)| = \begin{cases} g(x) & \text{if } g(x) \geq 0 \\ -g(x) & \text{if } g(x) < 0 \end{cases}$$

Exercises

1. Evaluate the following expressions. Please put your final answer in the box provided.

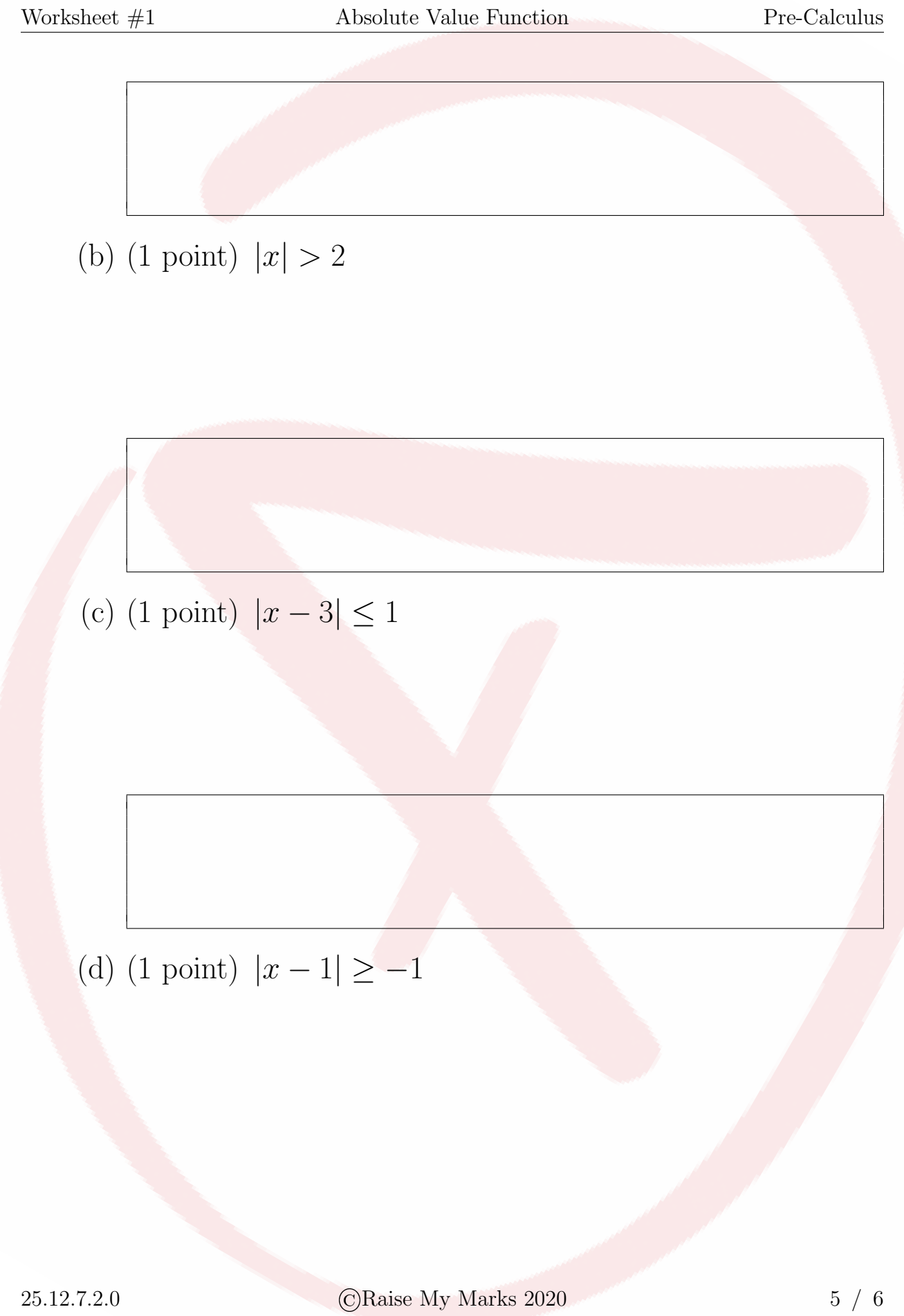   (a) (1 point) $|-3+2|$

   [box]

   (b) (1 point) $|3|-|-4|+|3-7|$

   [box]

   (c) (1 point) $|9-3|+5|-3|-3|-2|$

(d) (1 point) $|-5+2| + 4|3-10|$

(e) (1 point) $-|4-2| + 3|-10+6| - 2|5-3|$

2. Graph each number line. Please put your final answer in the box provided.

(a) (1 point) $|x| \leq 3$

(b) (1 point) $|x| > 2$

(c) (1 point) $|x - 3| \leq 1$

(d) (1 point) $|x - 1| \geq -1$

(e) (1 point) $|2x| < 1$