

Graphing Absolute Value Functions

Guided Notes

Absolute Value Function

An absolute value function is of the form:

$$f(x) = |x|$$

Such that when:

$$x > 0 \quad \Rightarrow \quad f(x) = x$$

$$x < 0 \quad \Rightarrow \quad f(x) = -x$$

The graph of an absolute value function is shown.

Translations of Absolute Value Function

An absolute value function translated in y-direction is of the form:

$$f(x) = |x| + k$$

- If k is positive, the graph of $y = |x|$ is translated up by k units.
- If k is negative, the graph of $y = |x|$ is translated down by k units.

Problem 1: What is the graph of $y = |x| - 3$?

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Translations of Absolute Value Function

An absolute value function translated in x-direction is of the form:

$$f(x) = |x + h|$$

- If ***h*** is positive, the graph of $y = |x|$ is translated left by ***h*** units.
- If ***h*** is negative, the graph of $y = |x|$ is translated down by ***h*** units.

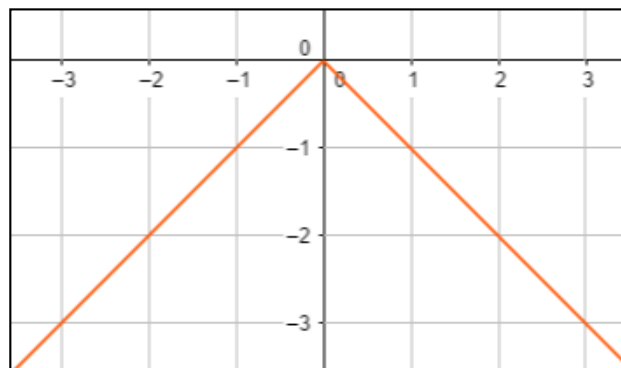
Problem 2: What is the graph of $y = |x + 2|$?

Reflection of Absolute Value Function

An absolute value function reflected downwards is of the form:

$$f(x) = -|x|$$

The graph of the reflected absolute value function is shown.



$$f(x) = -|x|$$