Section 3.2

The Graph of a Function

THE VERTICAL LINE TEST

A graph is the graph of a function if and only if no vertical line intersects the graph at more than one point.

SYMMETRY WITH RESPECT TO THE *y*-AXIS

- A graph is **symmetric with respect to the *y*-axis**, if, whenever the point (x, y) is on the graph, then $(-x, y)$ is also on the graph.
- Testing: If replacing x with $-x$ leaves the equation unchanged, then symmetric with respect to the *y*-axis.

SYMMETRY WITH RESPECT TO THE *x*-AXIS

- A graph is **symmetric with respect to the *x*-axis**, if, whenever the point (x, y) is on the graph, then $(x, -y)$ is also on the graph.
- Testing: If replacing y with $-y$ leaves the equation unchanged, then symmetric with respect to the *x*-axis.

SYMMETRY WITH RESPECT TO THE ORIGIN

- A graph is **symmetric with respect to the origin**, if, whenever the point (x, y) is on the graph, then $(-x, -y)$ is also on the graph.
- Testing: If replacing x with $-x$ and y with $-y$ leaves the equation unchanged, then symmetric with respect to the origin.