

Exercise 36

In Exercises 29–40, test for symmetry with respect to each axis and to the origin.

$$xy - \sqrt{4 - x^2} = 0$$

Solution

Replacing x with $-x$ changes the equation, so there's no symmetry with respect to the y -axis.

$$(-x)y - \sqrt{4 - (-x)^2} = 0 \quad \rightarrow \quad -xy - \sqrt{4 - x^2} = 0 \quad \rightarrow \quad xy + \sqrt{4 - x^2} = 0$$

Replacing y with $-y$ changes the equation, so there's no symmetry with respect to the x -axis.

$$x(-y) - \sqrt{4 - x^2} = 0 \quad \rightarrow \quad -xy - \sqrt{4 - x^2} = 0 \quad \rightarrow \quad xy + \sqrt{4 - x^2} = 0$$

Replacing x with $-x$ and y with $-y$ does not change the equation, so there is symmetry with respect to the origin.

$$(-x)(-y) - \sqrt{4 - (-x)^2} = 0 \quad \rightarrow \quad xy - \sqrt{4 - x^2} = 0$$

