Finding Areas of Regions Bounded by Curves – Examples

Example 1
Find the area of the region bounded by \( y = x + 1, \ y = 9 - x^2, \ x = -1, \) and \( x = 2. \) This region is pictured below.

Answer: The area is \( \frac{39}{2}. \)
Example 2
Find the area of the region bounded by $y = 12 - x^2$ and $y = x^2 - 6$. This region is pictured below.

**Answer:** The area is 72.
Example 3

Find the area of the region bounded by \( y = \frac{1}{x}, y = x, \) and \( y = \frac{1}{4}x, \) where \( x > 0. \) This region is pictured below.

![Graph showing the region bounded by the curves](image)

**Answer:** The area is \( \ln(2). \)
Example 4

Find the area of the region that is bounded above by the curve $y = x\sqrt{4 - x^2}$ and bounded below by the curve $y = x$. This region is pictured below.

Answer: The area is $\frac{5}{6}$. 