Homework Sheet: Area

Mimic the examples done in class on February 27 for the following regions, using a partition of the indicated axis. (Include a detailed picture that shows a typical rectangle with the coordinates of the appropriate points labeled, express the desired area as the limit of a Riemann sum, translate the Riemann sum into a definite integral, and evaluate the integral using the FTC.)

By partitioning the x-axis, find the area of:

1. The region bounded by \( y = x^2 + 1, \ y = x, \ x = -2, \) and \( x = 1. \)
2. The region bounded by \( y = x^2 \) and \( y = \sqrt{x} \).
3. The region bounded by \( y = x^2 + 4 \) and \( y = -x + 6 \).