Examples:

1. Determine the area of the region bounded by the curves \( y = x^2 + 2, y = \sin x, x = -1, \) and \( x = 2. \)

2. Determine the area of the region bounded by the curves \( y = x^2 - 1 \) and \( y = 7 - x^2. \)

Individual Questions:

1. Recall what we did last week and solve the following two problems:

   (a) Compute the derivative \( \frac{d}{dx} \int_{2x}^{e^{x-1}} \arctan t \, dt. \)

   (b) Compute \( \int \frac{x^2 + 1}{x^3 + 3x} \, dx. \)

2. Compute the area of the region bounded by the curves \( y = \frac{8}{x}, y = 2x, \) and \( x = 4. \)

3. Compute the area of the region bounded by \( y = \frac{x^2}{2} - 3 \) and \( y = x + 1. \)

4. Compute the area of the region bounded by the curves \( y = \sqrt{x}, y = 0 \) and \( y = x - 2. \)