1. Sketch the region enclosed by the graphs of the given equations. Then, use a definite integral to find the exact value of the area of the region.

(a) \( y = \frac{1}{x}, \quad y = 0, \quad x = 1, \quad x = e \)

(b) \( y = \sin x, \quad y = 0, \quad x = \frac{\pi}{6}, \quad x = \frac{\pi}{2} \)

(c) \( y = \frac{1}{1 + x^2}, \quad y = 0, \quad x = \frac{\sqrt{3}}{3}, \quad x = 1 \)

(d) \( x = e^y, \quad x = 0, \quad y = 1, \quad y = \ln 2 \)
(e) \( y = \sqrt{x}, \quad y = x^2 \)

(f) \( y = x^2, \quad y = 4x \)

(g) \( y = x^3, \quad y = 9x \)

(h) \( x = y^2, \quad x = 4 \)