427L: iterated integrals

Some integration practice

Evaluate the (definite or indefinite) integrals:

1.
$$\int \frac{\sqrt{y} - y}{y^2}\, dy$$

2.
$$\int \sec t(\sec t + \tan t)\, dt$$

3.
$$\int \frac{\sec^2 x}{\tan^2 x}\, dx$$

4.
$$\int_{-\pi/4}^{\pi/4} x^4 \sin x\, dx$$

Iterated integrals

1. Evaluate the integral
$$\iint_R \frac{yx^2}{y^2 + 2}\, dxdy,$$
where R is the rectangle $[0, 2] \times [-1, 1]$.

2. Evaluate the integral
$$\iint_R \frac{y}{1 + x^2}\, dxdy,$$
where R is the rectangle $[0, 1] \times [-2, 2]$.