Opgave 9.5.52

Use the region R with the indicated boundaries to evaluate each double integral

$$\iint_R \frac{1}{x}\ dy\ dx;\ 1 \leq x \leq 2,\ 0 \leq y \leq x - 1$$

— s. 559

Opstil

$$R = 1 \leq x \leq 2$$
$$0 \leq y \leq x - 1$$

$$\iint_R \frac{1}{x}\ dy\ dx$$

$$\int_1^2 \int_0^{x-1} \frac{1}{x}\ dy\ dx$$

Udregn

$$\int_1^2 \left[\frac{1}{x}y\right]_{y=0}^{y=x-1}\ dx$$

$$\int_1^2 \frac{1}{x}(x-1)\ dx$$

$$\int_1^2 1 - x^{-1}\ dx$$

$$[x - \ln(x)]_1^2$$

$$2 - \ln(2) - 1 + \ln(1)$$

$$1 - \ln(2)$$