DOUBLE INTEGRALS

Evaluate the following double integrals.

1. $\iint_R dA$ where R is the rectangle defined by $0 \le x \le 2$ and $0 \le y \le 1$.

2. $\iint_R dA$ where R is the region enclosed by the curves $y = -x^2 + 1$ and $y = x^2 - 1$.

3. $\iint_R \left(x^2 + y^2\right) dA$ where R is the square defined by $-1 \le x \le 1$ and $-1 \le y \le 1$.

4. $\iint_R (xy)\, dA$ where R is the region defined by $0 \le x \le 1$ and $0 \le y \le x^2$.

5. $\iint_R x(x + y) dA$ where R is the region defined by $0 \le x \le 1$ and $0 \le y \le 2$.

6. $\iint_R dA$ where R is the region defined by $0 \le x \le \ln y$ and $1 \le y \le 2$.

7. $\iint_R \frac{4y}{x^2 - 1} dA$ where R is the region defined by $2 \le x \le 3$ and $0 \le y \le 1$.