

Homework/ Double Integrals

Q1/ Evaluate the integral:

$$\int_0^1 \int_{-\sqrt[5]{x}}^{\sqrt{x}} \sin(y^3) dy dx$$

Q2/ Evaluate the integral:

$$\int_0^3 \int_{x^2}^9 x^3 e^{y^3} dy dx$$

by changing the order of integration.

Q3/ Compute the double integral:

$$\iint_R (4x + 2) dA$$

if R is the region bounded by the line $y = 2x$ and parabola $y = x^2$.

Q4/ Compute the double integral:

$$\int_0^1 \int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}} e^{-x^2-y^2} dy dx$$

Q5/ Compute the area bounded by the lines $y = -x + 1$, $y = x - 3$ and the curve $y = \sqrt{x - 1}$.

Q6/ Evaluate:

$$\iint_D xy dA$$

where D is the portion of the circle center $\mathbf{0}$, radius $\mathbf{1}$, that lies in the first quadrant by using the polar coordinates.

Q7/ Find the area of the rose $r = \cos(2\theta)$.

Q8/ Compute the double integral:

$$\iint_R (x - y) \, dx \, dy$$

if R is the region bounded by two curves $x = \frac{y^2}{2} + 1$ and parabola $x = y^2$.