

MAT235 Tutorial 12

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Tutorial this week will focus on reviewing the Jacobian and changing variables of multivariable integrals. There will be a Quiz (9) during the last 15 minutes.

1. Evaluate $\iint_D \sin(9x^2 + 4y^2) dA$ where D is the region bounded by the ellipse $9x^2 + 4y^2 = 1$.
Hint: perform a change of variables to re-write the ellipse in the form of a circle.
2. Let R be the region in the first quadrant bounded by the curves $y = x$, $y = 3x$, $xy = 1$, and $xy = 3$. Using the change of variables given by $x = u$, $y = \frac{v}{u}$, re-write $\iint_R xy dA$ in terms of the u and v coordinates. Your double integral should have order $du dv$ and simplify the bounds/integrand as much as possible without evaluating the integral.