

Assignment 5

1. Find the extrema and the saddle points if any of the function

$$f(x, y) = x^4 + y^4 - 4xy + 1$$

2. Find the extrema of the function $f(x, y) = x^2 + y^2 - 2x$ over the region R, where R is the triangular region, enclosed by the vertices (0,0), (2,0) and (0,2.)

3. Use the method of Lagrange Multipliers to obtain the maximum and the minimum values of $f(x, y, z) = xyz$ subject to $x^2 + 2y^2 + 3z^2 = 6$

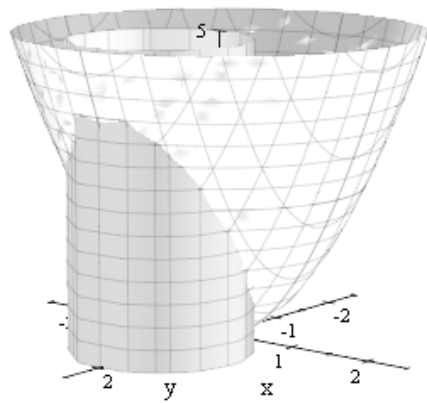
4. Calculate the iterated integral $\int_1^3 \int_0^1 (1+4xy) dx dy$

5. Evaluate $\int_0^3 \int_{y^2}^9 y \cos(x^2) dx dy$ by reversing the order of integration.

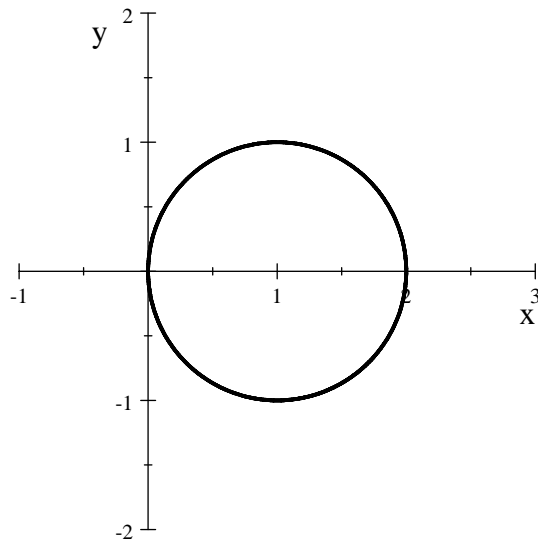
6. Find the volume (exact value) of the cylinder that lies under the
 Paraboloid $z = x^2 + y^2$, above the xy -plane, and inside the cylinder
 $x^2 + y^2 = 2x$

Hint:

Look at a graph of the paraboloid and the cylinder



And also note that the polar equation of the circle



is $r = 2\cos\theta$

