

MTH 2227 Test #3
SPRING 2018

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Name _____

- Given $f(x, y) = 4x^2y + 2xy^3 - 5$, show that $f_{xy} = f_{yx}$
 - Convert from Spherical to Rectangular Coordinates: $(\rho, \theta, \phi) = (8, \frac{\pi}{3}, \frac{\pi}{4})$
 - Convert from Rectangular to Spherical Coordinates: $(x, y, z) = (4, 4, 2)$ (Do not attempt to convert ϕ into increments of π)
 - Convert the following equation from Rectangular Coordinates to Spherical Coordinates: $x^2 + y^2 = 4z$

5. Find the relative maxes and mins of the function $f(x, y) = x^2 + 4y^2 + 4$, using the techniques of Calculus.

6. Convert to Cylindrical Coordinates and Integrate: $\int_{-4}^4 \int_{-\sqrt{16-x^2}}^{\sqrt{16-x^2}} \int_0^{4+\sqrt{16-x^2-y^2}} 1 dz dy dx$