Math 193: Extra Practice for Chapter 29

1. For the function $f(x, y) = x^2 \cos 4y$, evaluate the following.

   (a) $\left.\frac{\partial f}{\partial x}\right|_{(3,\pi)}$

   (b) $\left.\frac{\partial f}{\partial y}\right|_{(3,\pi)}$

2. Find the first partial derivatives of the following function with respect to each of the independent variables.

$$f(r, t) = 4r^2 + \ r \ln\left(t^3\right)$$

3. Find all of the second partial derivatives (all four of them) for the following function.

$$f(x, y) = \frac{\sin 3y}{1 + x^2}$$

4. Evaluate.

$$\int_1^2 \int_0^{\sqrt{y}} \left(2xy + y^2\right) dx\, dy$$

5. Integrate the following.

$$\int_0^{\pi/2} \int_0^{\sin y} e^{2x} \cos y \, dx\, dy$$

6. Set up but DO NOT EVALUATE the first-octant volume under the plane $z = x + y$ and inside the cylinder $x^2 + y^2 = 9$ in

   (a) rectangular coordinates

   (b) polar coordinates

   (Well, okay, you can evaluate it if you insist, but the point is to set it up correctly.)

7. Find the first-octant volume below the surface $z = 3x^2$ and bounded by the plane $x + y = 3$.

Last modified on January 26, 2018 by Patricia Wrean.