

Reading Assignment # 14

Math 13 - Prof. Orellana

February 12, 2006

Read Sections 5.5 - Review integration by parts.

Don't forget to let me know the pages where you found the answers. You should write full sentences when you do these assignments to help you study from them before the next exam.

1. Read Example 10. What is the integral in Cartesian coordinates over a disk $x^2 + y^2 \leq a$ of a function f ?
2. Read Example 10. What is the Jacobian when we change from Cartesian to polar coordinates. Change the integral you wrote in question (1) in polar coordinates.
3. Read the last paragraph of Example 10 and tell me for what regions will it be convenient to use polar coordinates.
4. Read the sketch of the proof of Theorem 5.3, what is $h(u, v)$ approximating? Why would you want to use a linear approximation at this point, more explicitly, what is nice about linear maps? What allow us to do this linear approximation?
5. How is Proposition 5.1 used when we compute the area of P at the beginning of page 334?
6. What is the Jacobian for $T : \mathbb{R}^3 \rightarrow \mathbb{R}^3$, a transformation from uvw -space to xyz -space?
7. What does Theorem 5.5 say?
8. What is the Jacobian when we transform to cylindrical coordinates? Write the triple integral of $f(x, y, z)$ over a cylinder of radius a and height h (from xy -plane) in cylindrical coordinates.
9. What is the Jacobian when we transform to spherical coordinates? Write the triple integral of $f(x, y, z)$ over a sphere of radius a .