Reading Assignment # 13

Math 13 - Prof. Orellana

February 2, 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. What can contribute to the to difficulties in computing multiple integrals? What technique is being introduced in Section 5.5 to simplify some of the computations?

2. What is a coordinate transformation? Give an example of such a transformation.

3. How is a linear tranformation $T : \mathbb{R}^2 \to \mathbb{R}^2$ defined?

4. What does Proposition 5.1 say? Give an example of a 2×2 matrix that satisfies this proposition and one that does not satisfy this proposition.

5. Using the example that satisfies Proposition 5.1 in the previous question, draw the image, $T(R)$ of the rectangle $R = [1, 2] \times [1, 2]$. What is the area of $T(R)$?

6. What is the objective of Example 6?

7. What does a linear transformation do to a parallelepiped?

8. What is the point of Example 7?

9. How does the method of substitution work?

10. What is the Jacobian of a transformation? In the paragraph after the definition they explain the notation, does the notation mean that the Jacobian is a partial derivative? What role does it play? Give a good explanation with complete sentences.

11. How do change of variables work for double integrals? Read Theorem 5.3 to answer this question.