Math 2057, Section 5

Material covered until Nov. 28, 2005

Test #3 is on Thursday, Dec. 1. The material for the test is

- Sections 15.3 - 15.8 and Section 16.1. The following two items from Chapter 15 are excluded:
- parts of Section 15.5, page 1012–1018: Moment of Inertia, Probability, and Expected Value.
- Section 15.6, which will be covered later, is not on the test. Material: Section 14.1–14.5, everything except partial differential equations.

Remember that it is sometimes very important to choice the right order of integration!

Material covered until Nov. 28

Section 15.3, Double Integrals over General Regions. Make sure that you understand the framed boxes on page 997

Exercises from Section 15.3: 1–29 every second odd, 31, 37, 39, and 43–47 odd

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Section 15.4, Double Integrals in Polar Coordinates.
Important: Box on p. 1005:
If f is continuous on a polar rectangle R given by

$$0 \le a \le r \le b \qquad \alpha \le \theta \le \beta$$

where $0 \le \beta - \alpha \le 2\pi$. Then

$$\begin{aligned} \iint_R f(x,y)\,dA &= \int_\alpha^\beta \int_a^b f(r\cos\theta, r\sin\theta)\, r\, dr d\theta \\ &= \int_a^b \int_\alpha^\beta f(r\cos\theta, r\sin\theta)\, r\, d\theta dr\,. \end{aligned}$$

Exercises from Section 15.4: 1-5 odd, 9–29 2^{th} odd

Section 15.5 Applications of Double Integrals: We did not go over much material from this section and no problems were assigned. But part of the material shows up in other section. We discussed:

- Density and Mass;
- Moment of Inertia.

You have to know how to find the volume and the mass!

Section 15.7 Triple Integrals
Important: The boxes on p. 1024 and 1025, how to evaluate triple integrals.

Exercises from Section 15.7: 1–19 odd, 27, 29, 33

Section 15.8 Triple Integrals in Cylindrical and Spherical Coordinates.
Important:

- Box p. 1033;
- Box p. 1035.

Exercises from Section 15.8: 1–19, 29, 33

Section 16.1 Vector fields:
Important:

- Definition of a vector field on two and three dimensions (p. 1056);
- The gradient as a vector field (p. 1059);
- Example 4 (p. 1058);
- Potential function and conservative vector field (p. 1060).

Exercises from Section 16.1: 1–17 odd, 21, 25, 29, 31
