

Review 3 Math 261

Any term in **bold face** know the definition or statement of the Theorem well enough to state it on the test. The definition you give should be similar to the one in the book or have similar detail.

Section 15.3 Be able to compute **double integrals** over general regions. Drawing regions and finding limits of integration are important.

Sample problems : example 4 exercises 14, 23

Section 15.5 Be able to find the **center of mass** for a plate. **formula for finding center of mass of a plate, joint density function, expected values**

Sample problems : example 2,7 exercise 7, 27

Section 15.6 **Surface Area**

Sample problems : 9

Section 15.7 Be able to compute **triple integrals**, Be able to Set up the integrals for finding the center of mass for a volume.

Sample problems : example 2,3,5 exercise 8,12

Section 15.4/15.8/15.9/15.10 **Jacobian**, Be able to compute Jacobians and use them to do a change of variables for a function of two or three variables especially for **polar and cylindrical coordinates**

Sample problems : 15.10 example 2 exercise 3,11, 13
15.4 example 1 exercise 8,9,23
15.8 example 3 exercise 17,21
15.9 example 4 exercise 21,24

Section 16.1 **Vector Field**, Be able to draw vector fields in \mathbb{R}^2 , **gradient** as vector field, **potential function, Conservative Vector field**

Sample problems : example 1, exercise 2,7,25

Section 16.2 **Line integrals**, $\int_C f(x,y)ds$, $\int_C f(x,y)dx$, $\int_C f(x,y)dy$,
 $\int P(x,y)dx + Q(x,y)dy$, $\int_C \mathbf{F} \cdot d\mathbf{r}$

Sample problems : example 1, 4, 7 exercise 6, 11, 20 ,41

Section 16.3 **Fundamental Theorem of line integrals, independence of path**, be able to apply Theorems 3,4,5,6 and **be able to sketch the proofs of Theorem 2 and Theorem 5**

Sample problems : example 4,5 exercise 12, 16