

- (1) From Section 17.5: 2, 6, 14, 16, and 29.
- (2) Let  $f$  and  $g$  be scalar functions defined throughout the plane. Show that
 
$$\oint_C g \nabla f \, d\mathbf{r} = - \oint_C f \nabla g \, d\mathbf{r}$$
 for any simple closed curve  $C$ .
- (3) From Section 17.6: 20, 24, 42, 46, 60(a)(c).  
(In 5th Ed: 18, 22, 38, 44, 56(a)(c).)
- (4) Approximating the earth by a sphere, find the latitude above which lies one quarter of the earth's surface. (Note that Los Angeles lies in this 'northern quarter' of the earth.)
- (5) From Section 17.7: 6, 10, 20, 23.  
(In 5th Ed: 6, 10, 28, 23.)

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*Midterm 2*

The midterm will cover the material up to and including Section 17.5. While the focus will be on the new material covered since the first midterm, earlier material is still eligible for examination.

Answers to the following practice problems can be found in the back of the textbook:

- (1) Chapter 16 Review, Exercise 47.  
(Problem 49 in the 5th edition.)
- (2) Chapter 17 Review, Exercise 2. (either edition).
- (3) 17.3.7 (In the 5th edition, 17.3.9)
- (4) 17.4.13 (In the 5th edition, 17.4.15)
- (5) Suppose

$$\frac{\partial P}{\partial y} = \frac{\partial Q}{\partial x}$$

throughout a planar region  $D$ . Under what additional assumption(s) does this imply that there is a function  $f$  on  $D$  so that

$$\frac{\partial f}{\partial x} = P \quad \text{and} \quad \frac{\partial f}{\partial y} = Q.$$