Instructions

- Homework will NOT be accepted through email or in person. Homework must be submitted through CourseWare BEFORE the deadline.
- Submit the completed assignment at http://www.casa.uh.edu under "EMCF" and choose LecAlt12.

1. Rewrite using polar coordinates: \( \int_{-2}^{2} \int_{0}^{\sqrt{4-x^2}} 3\sqrt{x^2+y^2} \, dy \, dx \)
   
   a. \( \int_{0}^{2\pi} \int_{0}^{2} 3r \, dr \, d\theta \)
   
   b. \( \int_{0}^{2\pi} \int_{0}^{2} 3r^2 \, dr \, d\theta \)
   
   c. \( \int_{-\pi/2}^{\pi/2} \int_{0}^{2} 3r^2 \, dr \, d\theta \)
   
   d. \( \int_{0}^{\pi} \int_{0}^{2} 3r^2 \, dr \, d\theta \)
   
   e. None of these

2. Which of the following is the integral of \( f(x, y) = x + 2y \) over \( 0 \leq x^2 + y^2 \leq 4, y \geq 0 \).
   
   a. \( \int_{0}^{\pi/2} \int_{0}^{2} (r^2 \cos \theta + 2r^2 \sin \theta) \, dr \, d\theta \)
   
   b. \( \int_{0}^{\pi/2} \int_{0}^{2} (r \cos \theta + 2r \sin \theta) \, dr \, d\theta \)
   
   c. \( \int_{0}^{\pi/2} \int_{0}^{2} (r \cos \theta + 2r^2 \sin \theta) \, dr \, d\theta \)
   
   d. None of these
3. A physical interpretation of a line integral would be that the line integral gives the work done by a force on a particle which moves along a curved path.
   a. True
   b. False

4. Given a function \( f(x, y) \), the function \( \nabla f(x, y) \) can be thought of as a vector field.
   a. True
   b. False

5. The value of a line integral \( \int_C \mathbf{h}(\mathbf{r}) \cdot d\mathbf{r} \) depends on the vector field \( \mathbf{h} \).
   a. True
   b. False

6. The value of a line integral \( \int_C \mathbf{h}(\mathbf{r}) \cdot d\mathbf{r} \) depends on the path (curve) \( C \).
   a. True
   b. False

7. Choose A