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](http://www.casa.uh.edu) under "EMCF" and choose LecAlt02.

1. Two vectors are parallel if
   a. They have the same signs
   b. Their dot product is zero
   c. They are scalar multiples of each other
   d. Their norm is 1
   e. None of these

2. Find the volume of the parallelepiped with the given edges.
   \[ \mathbf{i} - 2\mathbf{j} + \mathbf{k}, \quad 3\mathbf{j} - \mathbf{k}, \quad \mathbf{i} + \mathbf{j} - 3\mathbf{k} \]
   a. 27
   b. 9
   c. 12
   d. 18
   e. 10

3. Which of the following make sense?
   I. \[ \mathbf{a} \times (\mathbf{b} \times \mathbf{c}) \]
   II. \[ \mathbf{a} (\mathbf{b} \cdot \mathbf{c}) \]
   III. \[ \mathbf{a} \cdot (\mathbf{b} \times \mathbf{c}) \]
   IV. \[ \mathbf{a} \cdot (\mathbf{b} \cdot \mathbf{c}) \]
   a. I and III
   b. II and IV
   c. I, II and III
   d. II, III, and IV
   e. I, II, III, and IV

4. The direction of the cross product of two vectors is determined by the:
   a. Left Hand Rule
   b. Right Hand Rule
   c. Rules of Engagement
   d. Golden Rule
   e. None of these
5. The cross product is related to the area of a:
   a. Circle
   b. Square
   c. Trapezoid
   d. Parallelogram
   e. None of these

6. Given \( \mathbf{a} = \mathbf{i} - 2\mathbf{j} + \mathbf{k} \) and \( \mathbf{b} = 3\mathbf{j} - \mathbf{k} \), find \( \mathbf{b} \times \mathbf{a} \)
   a. \(-\mathbf{i} + \mathbf{j} + 3\mathbf{k}\)
   b. \(\mathbf{i} - 3\mathbf{j} + \mathbf{k}\)
   c. \(\mathbf{i} - \mathbf{j} - 3\mathbf{k}\)
   d. \(\mathbf{i} + \mathbf{j} + 3\mathbf{k}\)
   e. None of these

7. The angle between two vectors should always be in which interval?
   a. \([0, 2\pi]\)
   b. \([0, \pi]\)
   c. \([\pi, 2\pi]\)
   d. \(\left[0, \frac{\pi}{2}\right]\)
   e. None of these

8. A good way to think of the idea of a vector projection is to think of it as which of the following?
   a. A shadow
   b. A dream
   c. A light
   d. A parallelepiped
   e. None of these

9. Choose the correct answer for LecPop02_2 question #4
   a. A
   b. B
   c. C
   d. D
   e. E

10. Choose the correct answer for LecPop02_1 question #3
    a. A
    b. B
    c. C
    d. D
    e. E