

Math 222 Quiz 11

Dec. 2, 2010

Your Name:

Your Section:

*Instructions: Since we missed many topics, for this quiz, time is **30** minutes and the total score is **15** points. **Wait until the last minute.***

- (a). $P(1, 1, 1), Q(2, 1, 3), R(3, -1, 1)$. Find the area of the triangle determined by these three points and one unit vector perpendicular to this triangle. If the points are $P(1, 1), Q(2, 1), R(3, -1)$, find the area again.(4')
(b). $\mathbf{u} = 2\mathbf{i} + \mathbf{j}, \mathbf{v} = 2\mathbf{i} - \mathbf{j} + \mathbf{k}, \mathbf{w} = \mathbf{i} + 2\mathbf{k}$. Find the triple scalar product $(\mathbf{u} \times \mathbf{v}) \cdot \mathbf{w}$ and the volume of the parallelepiped determined by these three vectors.(2')
- $P(3, -2, 1)$ $L: x = 1 + 2t, y = 2 - t, z = 3t$. Find the line through P and parallel to L ($2'$), the distance between P and L ($2'$), and the plane through P and perpendicular to L ($2'$).
- Choose **THREE** of the following. Circle directly. No need to explain. If you answer more than three, I'll grade the first three you answered.(3')
 - ①. If $\angle AOB = \pi/3$, the angle between \overrightarrow{AO} and \overrightarrow{OB} is: ($\pi/3$ vs $2\pi/3$)
 - ②. Is $\mathbf{a} \cdot (\mathbf{b} \times \mathbf{c})$ equal to $\mathbf{c} \cdot (\mathbf{b} \times \mathbf{a})$: (Yes vs No)
 - ③. If $\mathbf{u} \cdot \mathbf{v}_1 = \mathbf{u} \cdot \mathbf{v}_2$, is $\mathbf{v}_1 = \mathbf{v}_2$ right: (Yes vs No)
 - ④. If the relation in ③ is right for all \mathbf{u} , what's the answer: (Yes vs No)
 - ⑤. $\mathbf{a} \cdot (\mathbf{b} \times \mathbf{c})$ is always the volume of the parallelepiped determined by the three vectors even if the determinant may be negative: (True vs False)
 - ⑥. $|\mathbf{a} \times \mathbf{b}|^2 + |\mathbf{a} \cdot \mathbf{b}|^2$ equals: ($|\mathbf{a} + \mathbf{b}|^2$ vs $|\mathbf{a}|^2|\mathbf{b}|^2$)