Math 233 - Quiz 2

Name _____

January 28, 2021

Score _____

Show all work to receive full credit. Supply explanations when necessary. This quiz is due February 4.

---

1. (1.5 points) Find a vector of magnitude 3 that is orthogonal to both $\vec{u} = 3\hat{\imath} - 2\hat{\jmath} + \hat{k}$ and $\vec{w} = 5\hat{\imath} + 2\hat{\jmath} + 2\hat{k}$.

2. (2 points) Use vectors to determine the area of the triangle with vertices at $A(0, 1, 3)$, $B(-3, 2, 1)$ and $C(2, 3, 2)$.

3. (1.5 points) Find the volume of the parallelepiped determined by the vectors $\vec{a} = 3\hat{\imath} - 2\hat{\jmath} + \hat{k}$, $\vec{b} = -\hat{\imath} + \hat{\jmath} - 4\hat{k}$, and $\vec{c} = 4\hat{\imath} + 2\hat{\jmath} - \hat{k}$.

Turn over.

4. (2 points) Find parametric and symmetric equations for the line in space passing through the points $P(2, 3, -1)$ and $Q(3, 1, 1)$.

5. (1 point) Refer back to problem 2. Find an equation for the plane containing the triangle, $\triangle ABC$.

6. (2 points) Consider the plane described by the equation $2x - y + 3z = 7$.

   (a) Find a unit vector perpendicular to the plane.

   (b) Find the distance from the plane to the point $P(1, 1, 1)$.