

**WRITE YOUR NAME:**

MAC 2313 B51 Spring 2024

Written homework #2

Due Tuesday January 23rd, in Canvas

**Question 1.** Evaluate the cross product of the vectors  $\mathbf{u} = \langle 1, 2, 3 \rangle$  and  $\mathbf{v} = \langle -1, 0, 2 \rangle$ . Also evaluate  $(\mathbf{u} \times \mathbf{v}) \cdot \mathbf{v}$ , and explain why it is equal to zero.

**Question 2.** Find the area of the parallelogram that has the vectors  $\mathbf{u} = \langle 3, -1, 0 \rangle$  and  $\mathbf{v} = \langle 0, 3, 2 \rangle$  as two of its adjacent sides.

**Question 3.** Find both the vector equation and the parametric equations of the line through  $(-3, 4, 2)$  that is perpendicular to both  $\mathbf{u} = \langle 1, 1, -5 \rangle$  and  $\mathbf{v} = \langle 0, 4, 0 \rangle$ .

**Question 4.** Find the equation of the plane passing through the points  $(0, 1, 0)$ ,  $(2, 1, 4)$ , and  $(-2, 1, 0)$ .