

Quiz #2

Monday, February 5 2018

Duration: 15 min

NAME: _____

Please write clearly and properly.

Problem	Grade
1	
2	
3	
Total	

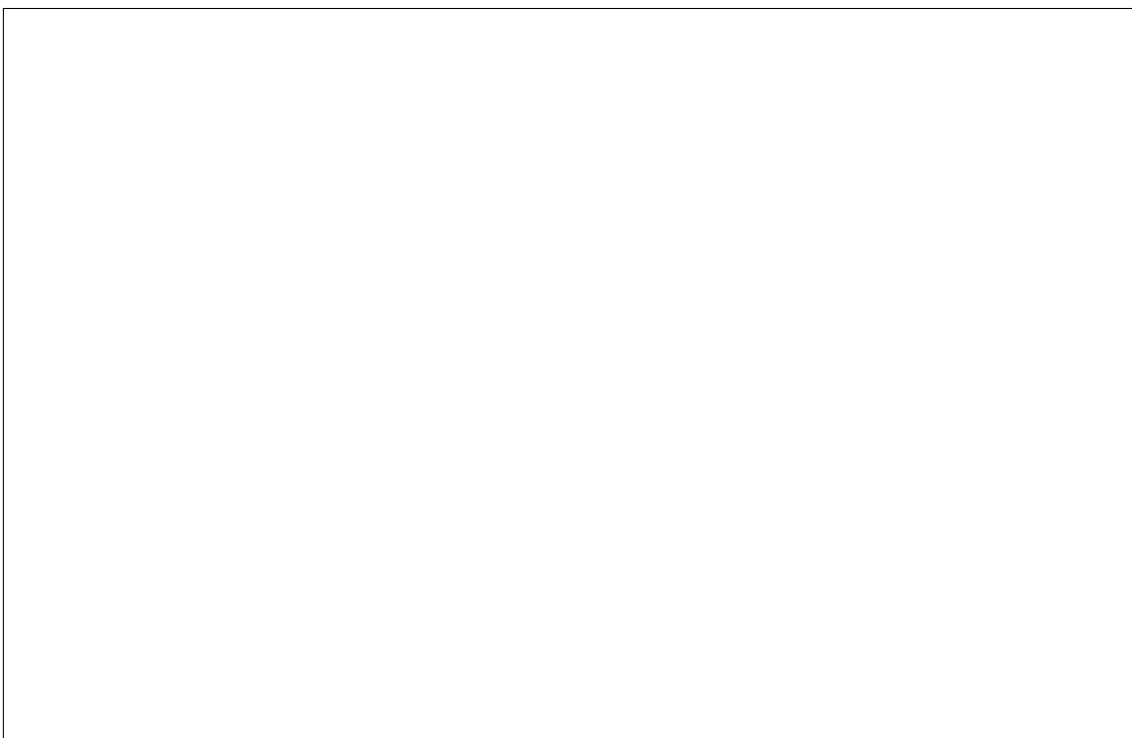
Problem 1 (~ 4 points).

In each of the following cases, are the vectors \vec{u} and \vec{v} orthogonal? Explain.

(1) $\vec{u} = (-2, 2)$ and $\vec{v} = (1, 1)$.




(2) $\vec{u} = (1, 2, 3)$ and $\vec{v} = (1, 2, -1)$.



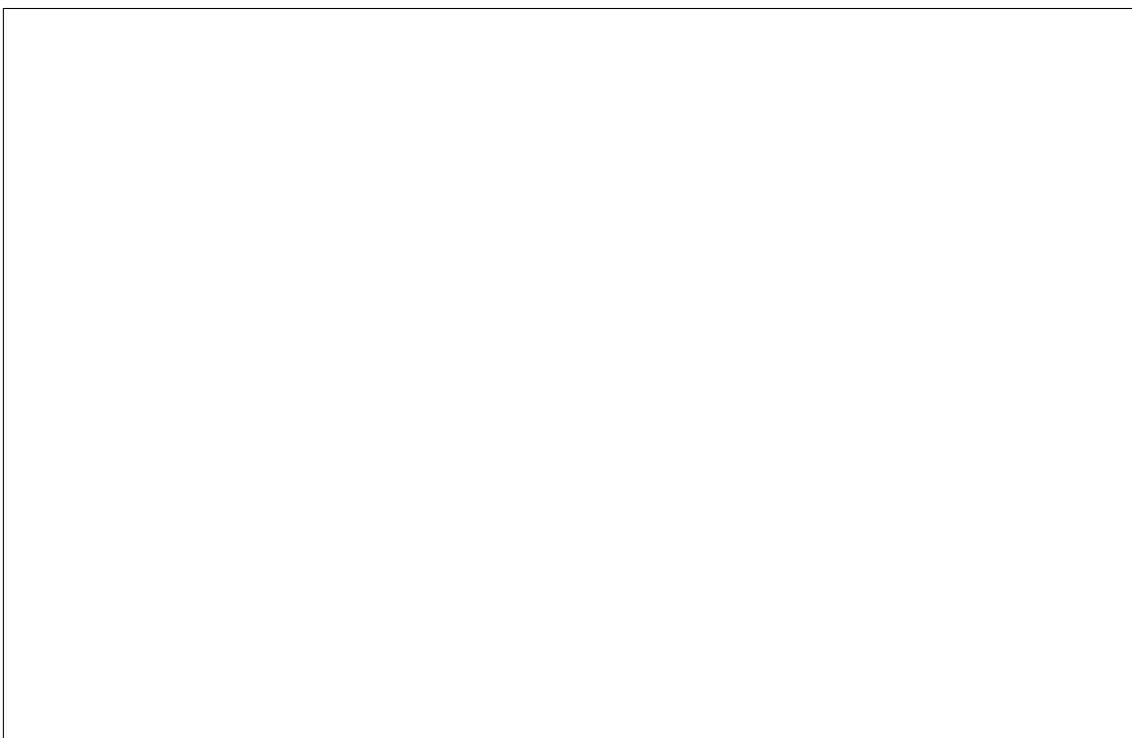
Problem 2 (~ 4 points).

In each of the following cases, find a vector that is orthogonal to both \vec{u} and \vec{v} .

(1) $\vec{u} = (0, 1, 0)$ and $\vec{v} = (0, 0, 1)$.



(2) $\vec{u} = (2, 1, 0)$ and $\vec{v} = (-1, 1, 0)$.



Problem 3 (~ 2 points).

True or false? *No explanations required.*

(1) For any two vectors \vec{u} and \vec{v} , if $\vec{u} \times \vec{v} = \vec{0}$, then \vec{u} and \vec{v} are parallel.

(2) If \vec{u} is a vector that lies in the xy -plane, then $\vec{u} \cdot \vec{k} = 0$.

Recall that \vec{k} is the coordinate vector $\vec{k} = (0, 0, 1)$.

(3) For any two vectors \vec{u} and \vec{v} ,

$$\vec{u} \cdot (\vec{u} \times \vec{v}) = 0 .$$

(4) For any two vectors \vec{u} and \vec{v} ,

$$(\vec{u} \cdot \vec{v})^2 + \|\vec{u} \times \vec{v}\|^2 = \|\vec{u}\|^2 \|\vec{v}\|^2 .$$