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Mathematics 206a: Multivariable Calculus
Winter Semester 2006

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Quiz #2

January 9

Suppose $\mathbf{u} = \begin{bmatrix} 1 \\ 2 \\ 5 \end{bmatrix}$ and $\mathbf{v} = \begin{bmatrix} 3 \\ 0 \\ 4 \end{bmatrix}$

A. Calculate $\|\mathbf{u}\|$, the magnitude of \mathbf{u} .

B. Calculate the dot product $\mathbf{u} \cdot \mathbf{v}$.

C. If θ is the angle between \mathbf{u} and \mathbf{v} , then $\|\mathbf{u}\|\|\mathbf{v}\|\cos\theta = \mathbf{u} \cdot \mathbf{v}$.

Calculate $\cos\theta$.

D. Find a unit vector in the direction of \mathbf{u} by multiplying \mathbf{u} by the inverse of its length.