MATH 241 Thomas 13th Edition Name_____

Chapter 12, Section 3

The scalar quantity of the magnitude of the force **F** in the direction of vector **v** is:

The dot product **u** • **v** of vectors **u** $=< u_1, u_2, u_3 >$ and **v** $=< v_1, v_2, v_3 >$ is the scalar

The angle between two nonzero vectors **u** and **v:**

Perpendicular or orthogonal vectors

Properties of dot products: If **u, v** and **w** are any vectors and c is a scalar, then:

Projecting one vector **u** on to another vector **v**

If **u** represents a force then $\text{proj}_v\mathbf{u}$ (the vector projection of **u** one **v**) represents the effective force in the direction of **v.**

The vector projection of **u** on to **v**

Both vector projection of **u** on to **v** and the scalar component of **u** on to **v** depend only on the direction of the vector **v** and not its length (because we dot **u** with $\frac{\mathbf{v}}{|\mathbf{v}|}$, which is the direction of **v**).