MATH253X-UX1 Quiz 1
Fall 2021

Name: _____

Instructions. Either print this two-page file and fill in your answers or use a separate piece of paper. Then attach your work as a PDF. Show all your work in order to receive full credit. You have a total a 45 minutes from the time you enter the assignment to the time you submit it. No outside help allowed.

1. An object is located at the point $P(2, 0, -1)$, but is constrained so that it can only move in the straight-line direction toward the point $Q(0, 1, 3)$.

(a) (1 Points) Give, in coordinate form, a vector $\mathbf{v}$ representing the direction in which the object can move.

(b) (2 Points) Give, in coordinate form, a *unit* vector pointing in the direction that the object can move.

2. (2 Points) Find parametric equation of the line through $(-2, 2, 4)$ and perpendicular to the plane $2x - y + 5z = 12$.

3. (1 Points) Find the angle between the vectors $\langle 8, -1, 4\rangle$ and $\langle 0, 4, 2\rangle$.

4. (2 Points) Find the scalar and vector projections of $\langle 3, -3, 1\rangle$ onto $\langle 2, 4, 1\rangle$.

5. (2 Points) Find the equation of the plane through the point $(5, 3, 5)$ and normal to the vector $\langle 2, 1, -1\rangle$.