

Math 53 - Multivariable Calculus

Quiz # 3

February 3rd, 2012

Exercise 1. Suppose that $\vec{r} = \langle x, y, z \rangle$ and $\vec{r}_0 = \langle x_0, y_0, z_0 \rangle$, describe the set of all points (x, y, z) such that $|\vec{r} - \vec{r}_0| = 1$.

Exercise 2. Determine whether the two vectors $\vec{A} = \langle -5, 3, 7 \rangle$ and $\vec{B} = \langle 6, -8, 2 \rangle$ are perpendicular, parallel, or neither.

Exercise 3. Find a UNIT vector that is orthogonal to both $\hat{i} + \hat{j}$ and $\hat{i} + \hat{k}$. (Hint: Assume that $\vec{A} = \langle a_1, a_2, a_3 \rangle$ is such a vector and use the orthogonality to determine the value of \vec{A} 's coefficients, a_i .)