MT-A315 Introduction to Linear Algebra Worksheet 4.4

Group: _____ Present: _____

1. Show that the matrix A is an orthogonal matrix.

$$A = \begin{pmatrix} \frac{\sqrt{2}}{4} & -\frac{\sqrt{3}}{2} & \frac{\sqrt{2}}{4} \\ \frac{\sqrt{6}}{4} & \frac{1}{2} & \frac{\sqrt{6}}{4} \\ -\frac{\sqrt{2}}{2} & 0 & \frac{\sqrt{2}}{2} \end{pmatrix}$$

2. Find entries for the second column of B so that B is an orthogonal matrix.

$$B = \begin{pmatrix} -\frac{2}{3} & a & -\frac{2}{3} \\ -\frac{2}{3} & b & \frac{1}{3} \\ -\frac{1}{3} & c & \frac{2}{3} \end{pmatrix}$$

3. Let $v = [1, 1, 1]^t$. Compute Bv and compare $|Bv|$ to $|v|$. Why does this happen?