Homework *Sec* 3.3

(1 – 3)

a) Determine whether the set of vectors is ***orthogonal*** ?

b) Determine whether the set is ***orthonormal*** ?

c) Determine whether the set is a ***basis*** for $\mathbb{R}^n$

1. $\{(2, -4), (2, 1)\}$

2. $\{(4, -1, 1), (-1, 0, 4), (-4, -17, -1)\}$

3. $\left\{\left(\frac{\sqrt{2}}{2}, 0, 0, \frac{\sqrt{2}}{2}\right), \left(0, \frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}, 0\right), \left(-\frac{1}{2}, \frac{1}{2}, -\frac{1}{2}, \frac{1}{2}\right)\right\}$

Determine whether the set of vectors is ***orthogonal***? Determine whether the set is ***orthonormal***?

4. $\{(\sqrt{3}, \sqrt{3}, \sqrt{3}), (-\sqrt{2}, 0, \sqrt{2})\}$

Apply the Gram-Schmidt orthonormalization process to transform the given basis for $\mathbb{R}^n$ into orthonormal basis.

5. $B = \{(3, 4), (1, 0)\}$

6. $B = \{(2, 1, -1), (1, 2, 2), (2, -2, 1)\}$

7. $B = \{(1, 2, -1, 0), (2, 2, 0, 1), (1, 1, -1, 0)\}$