MAT 220—Homework 2

Part A:

Chapter 3 #1, 4, 10, 11, 16, 19
Chapter 4 #3

Part B:

1. Compute the following for $u = (2, 4)$, $v = (-3, 1)$, and $w = (-3, -5)$. Show your work.
(a) $\frac{1}{2}u$ **(b)** $-w$ **(c)** $-3v$ **(d)** $u + v$ **(e)** $v - w$ **(f)** $2u + 3w$
(g) $5u - 4v$ **(h)** $-2u + 2v - 3w$ **(i)** $u \cdot v$ **(j)** $||w||$
(k) **avg**(u) **(l)** **rms**(u) **(m)** **std**(u)
(n) **avg**(v) **(o)** **rms**(v) **(p)** **std**(v)
(q) **avg**(w) **(r)** **rms**(w) **(s)** **std**(w)
(t) **avg**(u, v, w) **(u)** **rms**(u, v, w) **(v)** **std**(u, v, w)
(w) Express v as a linear combination of the standard basis vectors e_1 and e_2.
(x) Which pair of u, v, w are closest to each other?
(y) Find the angle between u and w in radians and in degrees.
(z) Find the centroid of u, v, and w.

2. Compute the following for $u = (6, 2, 4)$, $v = (2, 0 - 3)$, and $w = (-3, 1, 2)$. Show your work.
(a) $\frac{1}{2}u$ **(b)** $-w$ **(c)** $-3v$ **(d)** $u + v$ **(e)** $v - w$ **(f)** $2u + 3w$
(g) $5u - 4v$ **(h)** $-2u + 2v - 3w$ **(i)** $u \cdot v$ **(j)** $||w||$
(k) **avg**(u) **(l)** **rms**(u) **(m)** **std**(u)
(n) **avg**(v) **(o)** **rms**(v) **(p)** **std**(v)
(q) **avg**(w) **(r)** **rms**(w) **(s)** **std**(w)
(t) **avg**(u, v, w) **(u)** **rms**(u, v, w) **(v)** **std**(u, v, w)
(w) Express v as a linear combination of the standard basis vectors e_1, e_2, and e_3.
(x) Which pair of u, v, w are closest to each other?
(y) Find the angle between u and w in radians and in degrees.
(z) Find the centroid of u, v, and w.

3. Find a vector that is orthogonal to both $a = (1, 2, 3, 4)$ and $b = (1, -1, 2, -2)$.