Homework Due Sept. 13 Daniel Gameiro 19500027

Section 12.1

5) $\vec{u} = \langle |u|\cos(45°), |u|\sin(45°) \rangle$

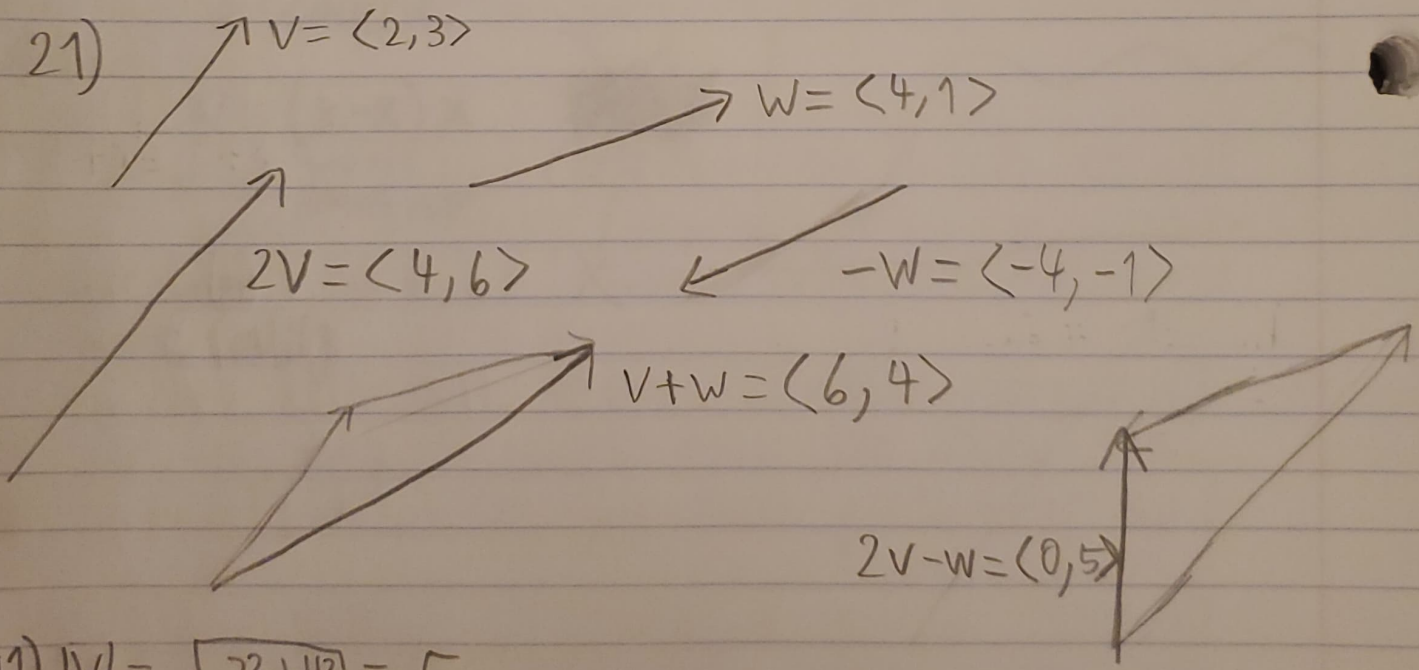
7) $\vec{w} = \langle |w|\cos(340°), |w|\sin(340°) \rangle$

9) $\overrightarrow{PQ} = \langle 2-3, 7-2 \rangle = \langle -1, 5 \rangle$

11) $\overrightarrow{PQ} = \langle 1-3, -4-5 \rangle = \langle -2, -9 \rangle$

15) $5\langle 6, 2 \rangle = \langle 30, 10 \rangle$

21)



41) $|v| = \sqrt{3^2+4^2} = 5$

$e_v = \langle 3/5, 4/5 \rangle$

47) $e = \langle 1\cdot\cos(4\pi/7), 1\cdot\sin(4\pi/7) \rangle \approx \langle -0.2225, 0.9749 \rangle$

Section 12.2

11) $1 - P_x = 3 \quad P_x = -2$
$4 - P_y = -2 \quad P_y = 6$
$3 - P_z = 3 \quad P_z = 0$

$P = (-2, 6, 0)$

13) $v = 4\langle 1, 2, 3\rangle$

Since v is a scalar multiple of $\langle 1,2,3\rangle$ any vector parallel to v will also be a scalar multiple of $\langle 1,2,3\rangle$

a) $\langle 2, 4, 6\rangle = 2\langle 1,2,3\rangle$
It is parallel to v and points in the same direction since the multiple is positive

b) Not parallel

c) $\langle -7, -14, -21\rangle = -7\langle 1,2,3\rangle$
It's parallel in the opposite direction since the multiple is negative

d) Not parallel

(#19 on next page)

25) unit vector $e_u = \langle 0.535, 0.267, -0.802\rangle$
unit vector $e_v = \langle 0.535, -0.267, 0.802\rangle$
Unit vectors aren't equal so u and v aren't parallel

27) $e_u = \langle -0.588, 0.196, 0.784\rangle$, $e_v = \langle 0.588, -0.196, 0.784\rangle$
unit vectors aren't equal so u and v aren't parallel

19) $-2\langle 8, 11, 3\rangle + 4\langle 2, 1, 1\rangle = \langle -16, -22, -6\rangle + \langle 8, 4, 4\rangle$
$= \langle -8, -18, -2\rangle$

31) Unit vector $e_v = \langle -4/6, 4/6, 2/6\rangle = \langle -2/3, 2/3, 1/3\rangle$
opposite direction $e_{v_{opposite}} = -1\langle -2/3, 2/3, 1/3\rangle = \langle 2/3, -2/3, -1/3\rangle$

49) $P_1(t) = (5, 5, 2) + t(0, -2, 1) = (5, -2t+5, t+2)$

$P_2(t) = (5, 5, 2) + t(0, -4, 2) = (5, -4t+5, 2t+2)$

51) $r_1(t) = \langle 4t-1, -2t+2, t+2\rangle$
$r_2(s) = \langle 2s, 1, s+1\rangle$

(1) $4t - 1 = 2s$
(2) $-2t + 2 = 1$
(3) $t + 2 = s + 1$

from (2) we get $t = 1/2$. Plug this into (1) and we get $s = 1/2$. Plug both into (3) and we get $2.5 = 1.5$ which is not true. This means r_1 and r_2 do not intersect.