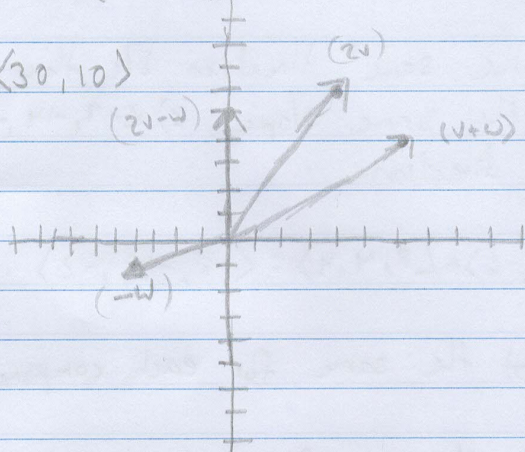1. $u = \langle u\cos 45, u\sin 45 \rangle$

7. $w = \langle w\cos 340°, u\sin 340° \rangle$

9. $\vec{PQ} = q - p = \langle -1, -5 \rangle$

11. $\vec{PQ} = \langle -2, -9 \rangle$

15. $\langle 30, 10 \rangle$

21.

$v + w$ $x = 6$ $y = 4$

$v = \langle 2, 3 \rangle$

$w = \langle 4, 1 \rangle$ $2v - w = \langle 4, 6 \rangle - \langle 4, 1 \rangle$

$= \langle 0, 5 \rangle$

41. e_v $v = \langle 3, 4 \rangle$ Magnitude: $\sqrt{3^2 + 4^2} = 5$ $\frac{3i + 4j}{5} = \frac{3}{5}i + \frac{4}{5}j$

$e_v = \langle \frac{3}{5}, \frac{4}{5} \rangle$

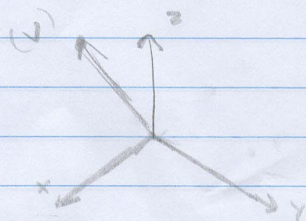47. $e = \langle \cos\frac{4\pi}{7}, \sin\frac{4\pi}{7} \rangle$

Calc 3   12.2 Hw

11. $PR = \langle 3, -2, 3 \rangle$ $R = \langle 1, 4, 3 \rangle$ $\vec{PR} = \vec{R} - \vec{P}$ $\vec{R} = \vec{PR} + P$ $R - \vec{PR} = \vec{P}$

$\vec{P} = \langle 1, 4, 3 \rangle - \langle 3, -2, 3 \rangle = \langle -2, 6, 0 \rangle$

13. a) $\langle 2, 4, 6 \rangle$ is parallel and in the same direction b/c they are both positive for every component with the same slope c) $\langle -7, -14, -21 \rangle$ is also parallel, but goes in an opposite direction.

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

25. Not parallel b/c the slopes are not the same for each component

27. Not parallel b/c the slopes are not the same for each component

31. $V = \langle -4, 4, 2 \rangle$ opposite $= \langle 4, -4, -2 \rangle$ $4^2 + (-4)^2 + (-2)^2 = 36$ $\sqrt{36} = 6$

$\langle 4, -4, -2 \rangle / 6 = \langle \frac{2}{3}, -\frac{2}{3}, -\frac{1}{3} \rangle = e_v$

49. 1) $\langle 5, 5, 2 \rangle + t\langle 0, -2, 1 \rangle$ 2) $\langle 5, 5, 2 \rangle + t\langle 0, -20, 10 \rangle$

$\times 10 \langle 0, -20, 10 \rangle$

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

$r_2(t) = \langle 0, 1, 1 \rangle + t\langle 2, 0, 1 \rangle = \langle 0, 1, 1 \rangle + \langle 2t, 0, t \rangle = \langle 2t, 1, 1+t \rangle$

$2+4t_1 = 2t_2$ $1-2t_1 = 1$ $1+t_1 = 1+t_2$ t_1 and t_2 are not equal
                     $t_1 = 0$ $t_1 = t_2$ they intersect