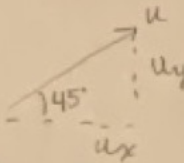


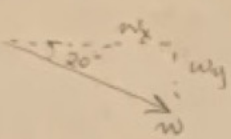
Afsana Rahman

Dr Z Calc 3

HW 1: 12.1 + 12.2

Homework due Sept 13

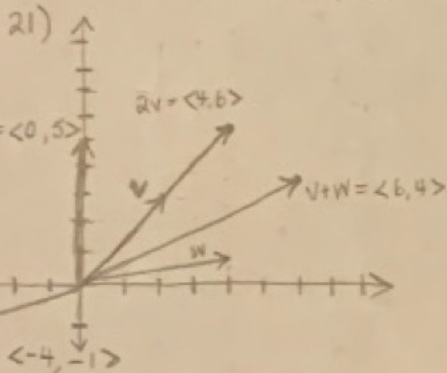
12.1 5)  $u_x = \|u\| \cos 45^\circ \Rightarrow \langle \frac{\sqrt{2}}{2} \|u\|, \frac{\sqrt{2}}{2} \|u\| \rangle$
 $u_y = \|u\| \sin 45^\circ$

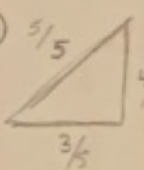
7)  $w_x = \|w\| \cos(-20^\circ) \Rightarrow \langle \|w\| \cos(-20^\circ), \|w\| \sin(-20^\circ) \rangle$
 $w_y = \|w\| \sin(-20^\circ)$

9) $\vec{PQ} = \langle q_1 - p_1, q_2 - p_2 \rangle$
 $= \langle 2 - 3, 7 - 2 \rangle = \langle -1, 5 \rangle$

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

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



41)  divide all sides by 5
 $e_v = \langle \frac{3}{5}, \frac{4}{5} \rangle$

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

12.2 11) $\vec{PR} = \langle r_1 - p_1, r_2 - p_2, r_3 - p_3 \rangle$

$\langle 3, -2, 3 \rangle = \langle 1 - p_1, 4 - p_2, 3 - p_3 \rangle$

$3 = 1 - p_1 \Rightarrow p_1 = -2$ $P = \langle -2, 6, 0 \rangle$

$-2 = 4 - p_2 \Rightarrow p_2 = 6$

$3 = 3 - p_3 \Rightarrow p_3 = 0$

13) $v = \langle 4, 8, 12 \rangle = 4 \langle 1, 2, 3 \rangle$

a) $\langle 2, 4, 6 \rangle = 2 \langle 1, 2, 3 \rangle$ PARALLEL + SAME DIR

b) $\langle -1, -2, 3 \rangle = -1 \langle 1, 2, -3 \rangle$ NOT PARALLEL

c) $\langle 7, -14, -21 \rangle = -7 \langle 1, 2, 3 \rangle$ ANTI-PARALLEL

d) $\langle 6, 16, 14 \rangle = 2 \langle 3, 8, 7 \rangle$ NOT PARALLEL

19) $-2 \langle 8, 11, 3 \rangle + 4 \langle 2, 1, 1 \rangle$

$= \langle -16, -22, -6 \rangle + \langle 8, 4, 4 \rangle$

$= \langle -8, -18, -2 \rangle$

25) $u = \langle 4, 2, -6 \rangle = 2 \langle 2, 1, -3 \rangle$

NOT PARALLEL

$v = \langle 2, -1, 3 \rangle$

27) $u = \langle -3, 1, 4 \rangle$

NOT PARALLEL

$v = \langle 6, 2, 8 \rangle = 2 \langle 3, 1, 4 \rangle$

31) $-v = \langle 4, -4, -2 \rangle = -2 \langle \frac{2}{3}, -\frac{2}{3}, -\frac{1}{3} \rangle$

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

49) $r_1(t) = \langle 5, 5, 2 \rangle + t \langle 0, -2, 1 \rangle$

$r_2(t) = \langle 5, 5, 2 \rangle + t \langle 0, -4, 2 \rangle$

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

$r(s) = \langle 0, 1, 1 \rangle + \langle 2s, 0, 8 \rangle = \langle 2s, 1, s + 1 \rangle$

$4t - 1 = 2s$ $2 - 2t = 1$ $t + 2 = s + 1$

$t = 1$

$t = s - 1$

$s = \frac{3}{2}$ $3s = -3$
 not equal $\rightarrow s = -1$