

12.1: 5, 7, 9, 11, 15, 21, 41, 47

12.2: 11, 13, 19, 25, 27, 31, 49, 51

### Homework 1

12.1 5.)  $\langle \cos 45^\circ \|u\|, \sin 45^\circ \|u\| \rangle \rightarrow \langle \frac{\sqrt{2}}{2} \|u\|, \frac{\sqrt{2}}{2} \|u\| \rangle$

7.)  $\langle \cos(-20^\circ) \|w\|, \sin(-20^\circ) \|w\| \rangle$

9.)  $P = (3, 2)$   $Q = (2, 7)$

$Q - P = \vec{PQ} = \langle -1, 5 \rangle$

11.)  $P = (3, 5)$   $Q = (1, -4)$

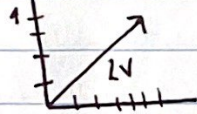
$Q - P = \vec{PQ} = \langle -2, -9 \rangle$

15.)  $5 \langle 6, 2 \rangle$

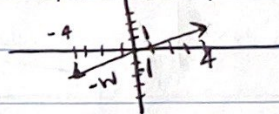
$\langle 30, 10 \rangle$

11.)  $v = \langle 2, 3 \rangle$   $w = \langle 4, 1 \rangle$

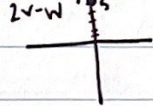
$2v = 2 \langle 2, 3 \rangle = \langle 4, 6 \rangle$



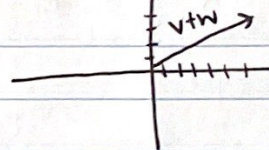
$-w = -\langle 4, 1 \rangle = \langle -4, -1 \rangle$



$2v - w = \langle 4, 6 \rangle + \langle -4, -1 \rangle = \langle 0, 5 \rangle$



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



41.)  $v = \langle 3, 4 \rangle$

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

$= \sqrt{9 + 16}$

$= \sqrt{25} = 5$

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

41.)  $\frac{4\pi}{7}$

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

12.2 11.)  $R = (1, 4, 3)$

$\vec{RQ} = \langle 3, -2, 3 \rangle$

$Q - P = \langle -2, 6, 0 \rangle$

13.)  $v = \langle 4, 8, 12 \rangle$

a.)  $\langle 2, 4, 6 \rangle$  parallel & same b.)  $\langle -1, -2, 3 \rangle$  non parallel (negatives)

c.)  $\langle -7, -14, -21 \rangle$  parallel & opposite d.)  $\langle 6, 10, 14 \rangle$  non parallel (diff factors)

19.)  $-2 \langle 8, 11, 13 \rangle + 4 \langle 2, 1, 1 \rangle$

$\langle -16, -22, -26 \rangle + \langle 8, 4, 4 \rangle$

$= \langle -8, -18, -22 \rangle$

12.2: 25, 27, 31, 49, 51

Homework 1 cont.

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

non parallel (signs)

27.)  $v = \langle -3, 1, 4 \rangle$   $v = \langle 6, -2, 8 \rangle$

non parallel (signs)

31.)  $v = \langle -4, 4, 2 \rangle$

$$|v| = \sqrt{(-4)^2 + (4)^2 + (2)^2}$$

$$= \sqrt{32+4}$$

$$= \sqrt{36}$$

$$|v| = 6$$

$$-e_v = \left\langle \frac{4}{6}, -\frac{4}{6}, -\frac{2}{6} \right\rangle$$

49.)  $P = (5, 5, 2)$

$$v = \langle 0, -2, 1 \rangle$$

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

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

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

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

$$\langle -1, 2, 2 \rangle + t \langle 0, -4, 2 \rangle = \langle 0, 1, 1 \rangle + t \langle 2, 0, 1 \rangle$$

$$\langle -1, 2, 2 \rangle - \langle 0, 1, 1 \rangle = t \langle 2, 0, 1 \rangle - t \langle 0, -4, 2 \rangle$$

$$\langle -1, 1, 1 \rangle = \langle -4t, 2t, -t \rangle + \langle 2t, 0, t \rangle$$

$$\langle -1, 1, 1 \rangle = \langle -2t, 2t, 0 \rangle$$

cannot meet!