

12.1

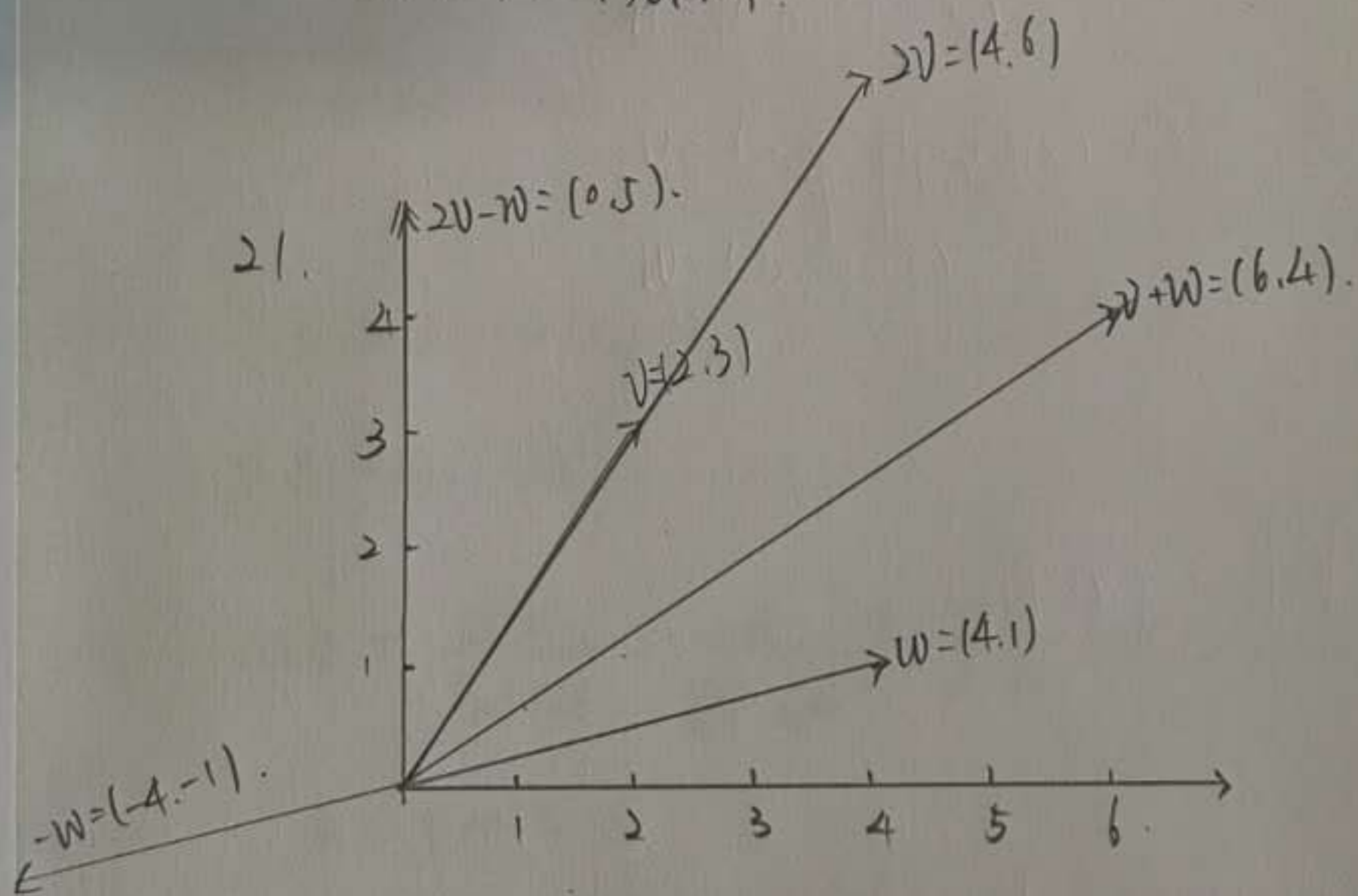
5. $(|u| \cdot \cos(45^\circ), |u| \cdot \sin(45^\circ))$

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

9. $\vec{PQ} = (-1, 5)$

11. $\vec{PQ} = (-2, -9)$

15. $5(6, 2) = (30, 10)$



41. $e_v = (\frac{3}{5}, \frac{4}{5})$

47. $e = (\cos \frac{4}{7}\pi, \sin \frac{4}{7}\pi)$

12.2

11. $W = \vec{PR} = (3, 2, 3)$

$R = (1, 4, 3)$

$$P = (W_1 + R_1, W_2 + R_2, W_3 + R_3)$$
$$= (2, -6, 0)$$

13. parallel: (a), (b), (c).

same direction: (a).

19. $-2(8, 11, 3) + 4(2, 1, 1)$

$$= (-8, -18, -2)$$

25. $\cos \theta = \frac{u \cdot v}{|u| |v|} = \frac{-12}{\sqrt{56} \sqrt{14}} = \frac{-12}{2 \cdot 14} \neq \pm 1$

$$\theta \neq 0 \text{ or } \pi$$

So, they aren't parallel.

27. $\frac{u_1}{v_1} = \frac{-3}{6} = -\frac{1}{2}$

$$\frac{u_2}{v_2} = -\frac{1}{2}$$

$$\frac{u_3}{v_3} = \frac{4}{8} = \frac{1}{2}$$

$$\frac{u_1}{v_1} = \frac{u_2}{v_2} \neq \frac{u_3}{v_3}$$

So, u and v aren't parallel.

31. $-e_v = \left(\frac{2}{3}, -\frac{2}{3}, -\frac{1}{3}\right)$

49. $l(t) = (5, 9, 0) + t \cdot (0, -2, 1)$

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

$r_2(t) = (2t, 1, t+1)$

$r_1(t) = r_2(t)$

$$\begin{cases} 4t-1 = 2t \\ -2t+2 = 1 \\ t+2 = t+1 \end{cases}$$

This equation set doesn't have a real solution of t .So $r_1(t)$ and $r_2(t)$ do not intersect.