

497: 5, 11-14, 19, 24-30, 36-37

5. $(-5, -4)$ $(8, -2)$ $\langle 13, 2 \rangle$ $|\vec{AB}| = \sqrt{173}$

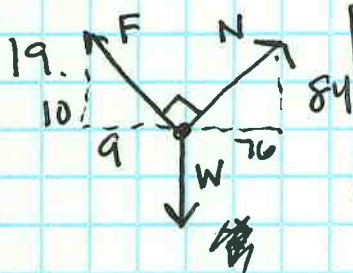
$\sqrt{13^2 + 2^2} =$

11. $4\vec{h} - \vec{g} = 4\langle -6, 2 \rangle - \langle -3, 5 \rangle$
 $\langle -24, 8 \rangle + \langle 3, 5 \rangle = \langle -21, 13 \rangle$

12. $\vec{f} + 2\vec{h} = \langle 8, 0 \rangle + 2\langle -6, 2 \rangle = \langle -4, 4 \rangle$

13. $3\vec{g} - 5\vec{f} + \vec{h} = 3\langle -3, -5 \rangle - 5\langle 8, 0 \rangle + \langle -6, 2 \rangle$
 $= \langle -9, -15 \rangle + \langle -40, 0 \rangle + \langle -6, 2 \rangle = \langle -55, -13 \rangle$

14. $2\vec{f} + \vec{g} - 3\vec{h} = 2\langle 8, 0 \rangle + \langle -3, -5 \rangle - 3\langle -6, 2 \rangle$
 $= \langle 16, 0 \rangle + \langle -3, -5 \rangle + \langle 18, -6 \rangle = \langle 31, -11 \rangle$



19. $\vec{F} = \langle -9, 10 \rangle$ $\vec{N} = \langle 76, 84 \rangle$ $\vec{W} = \langle 6, -170 \rangle$
 $\vec{F} + \vec{N} + \vec{W} = \langle 67, -76 \rangle$

24. $\vec{v} = \langle -2, 9 \rangle$

$\vec{u} = \frac{1}{\sqrt{-2^2 + 9^2}} \langle -2, 9 \rangle$

$= \langle -\frac{2\sqrt{85}}{85}, \frac{9\sqrt{85}}{85} \rangle$

25. $\vec{v} = \langle -1, -5 \rangle$

$\vec{u} = \frac{1}{\sqrt{1^2 + 5^2}} \langle -1, -5 \rangle$

$= \langle -\frac{\sqrt{26}}{26}, -\frac{5\sqrt{26}}{26} \rangle$

26. $\vec{v} = \langle 1, 7 \rangle$

$\vec{u} = \frac{1}{\sqrt{1^2 + 7^2}} \langle 1, 7 \rangle$

$= \langle \frac{\sqrt{50}}{50}, \frac{7\sqrt{50}}{50} \rangle$

$= \langle \frac{5\sqrt{2}}{50}, \frac{35\sqrt{2}}{50} \rangle$

$= \langle \frac{\sqrt{2}}{10}, \frac{7\sqrt{2}}{10} \rangle$

27. $\vec{v} = \langle 3, -4 \rangle$

$\vec{u} = \frac{1}{\sqrt{3^2 + 4^2}} \langle 3, -4 \rangle$

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

28. $D(4, -1) E(5, -7)$

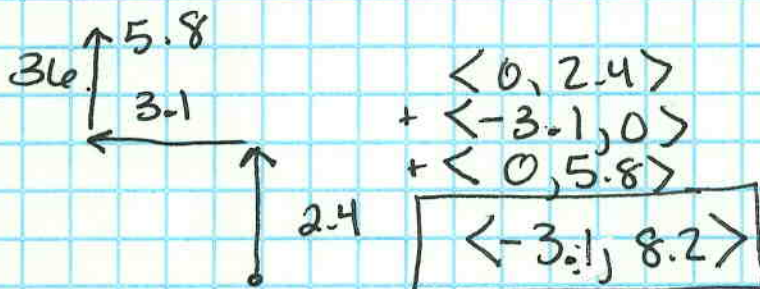
$$\vec{DE} = \langle 1, -6 \rangle \quad \vec{DE} = \boxed{\hat{i} - 6\hat{j}}$$

29. $D(9, -6) E(-7, 2)$

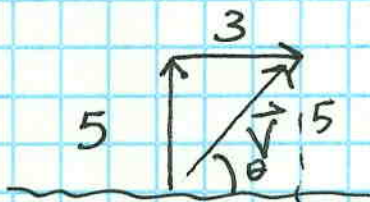
$$\vec{DE} = \langle -16, 8 \rangle \quad \vec{DE} = \boxed{-16\hat{i} + 8\hat{j}}$$

30. $D(3, 11) E(-2, -8)$

$$\vec{DE} = \langle -5, -19 \rangle \quad \vec{DE} = \boxed{-5\hat{i} - 19\hat{j}}$$



37.



a) $\langle 0, 5 \rangle + \langle 3, 0 \rangle = \langle 3, 5 \rangle$

$$|\vec{v}| = \sqrt{3^2 + 5^2} = \sqrt{34} \text{ mph}$$

$$\approx \boxed{5.8 \text{ mph}}$$

b) $\tan \theta = \frac{5}{3}$

$$\theta = \tan^{-1}\left(\frac{5}{3}\right) = \boxed{59.036^\circ}$$