1. $\langle -7-8, -10+7 \rangle$

$\boxed{\langle -15, -3 \rangle}$

2. $(10, -5) \cdot (7, 1)$

$\boxed{-3i + 6j}$

3. $-\langle 1, -6 \rangle + \langle -7, -5 \rangle$

$\langle -1, 6 \rangle + \langle -7, -5 \rangle$

$\boxed{\langle -8, 1 \rangle}$

4. $9(-9i) - 7(3i + 4j)$

$-81i - 21i - 28j$

$\boxed{-102i - 28j}$

5. $\sqrt{(-6)^2 + (-2)^2}$

$\sqrt{36 + 4}$

$\sqrt{40}$

$2 \cdot 2 \cdot 2 \cdot 5$

$\boxed{2\sqrt{10}}$

6. $\sqrt{(-15)^2 + (36)^2}$

$\sqrt{225 + 1296}$

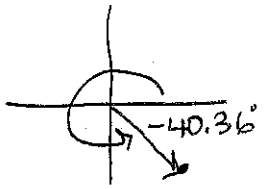
$\sqrt{1521}$

$\boxed{39}$

7. $\tan\theta = \frac{-17}{20}$

$\theta = \tan^{-1}\left(\frac{-17}{20}\right)$

$\theta = -40.36$

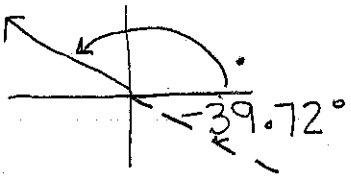


$360 + 40.36 = \boxed{319.64°}$

8. $\tan\theta = \frac{\sqrt{69}}{-10}$

$\theta = \tan^{-1}\left(\frac{-\sqrt{69}}{10}\right)$

$\theta = -39.72°$



$180 + -39.72 = \boxed{140.28°}$

9. $\frac{\langle 24, -32 \rangle}{\sqrt{24^2 + (-32)^2}} = \frac{\langle 24, -32 \rangle}{\sqrt{576 + 1024}}$

$\frac{\langle 24, -32 \rangle}{\sqrt{1600}} = \frac{\langle 24, -32 \rangle}{40}$

$\left\langle \frac{24}{40}, \frac{-32}{40} \right\rangle = \boxed{\left\langle \frac{3}{5}, -\frac{4}{5} \right\rangle}$

961

10. $\frac{-13i + 6\sqrt{22}\,j}{\sqrt{(-13)^2 + (6\sqrt{22})^2}} = \frac{-13i + 6\sqrt{22}\,j}{\sqrt{169 + 792}} = \frac{-13i + 6\sqrt{22}}{\sqrt{961}}$

$\frac{-13i + 6\sqrt{22}\,j}{31} = \boxed{\frac{-13}{31}i + \frac{6\sqrt{22}}{31}j}$

11. $-7(-4) + 0(5)$

$28 + 0$

$\boxed{28}$

12. $8(-6) + 6(6)$

$-48 + 36$

$\boxed{-12}$

13. $\cos\theta = \frac{3(-3) + 6(5)}{\sqrt{3^2+6^2}\,\sqrt{(-3)^2+5^2}}$

$\cos\theta = \frac{-9+30}{\sqrt{45}\sqrt{34}}$

$\theta = \cos^{-1}\left(\frac{21}{\sqrt{45}\sqrt{34}}\right)$

$\boxed{\theta = 57.53°}$

14. $\cos\theta = \frac{-6(3) + (-9)(3)}{\sqrt{(-6)^2+(-9)^2}\,\sqrt{3^2+3^2}}$

$\cos\theta = \frac{-18-27}{\sqrt{117}\sqrt{18}}$

$\theta = \cos^{-1}\left(\frac{-45}{\sqrt{117}\sqrt{18}}\right)$

$\theta = \boxed{168.69°}$

15. $25(3) + -15(5)$

$75 - 75$

0

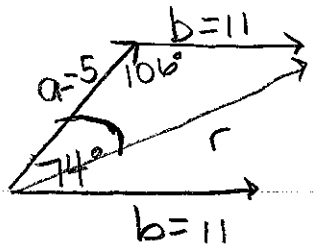
$\boxed{\text{Yes}}$ (because it $= 0$)

16. $-9(3) + -2(-4)$

$-27 + 8$

-19

$\boxed{\text{NO}}$ (because it doesn't $= 0$)



$$\begin{array}{r} 180 \\ -74 \\ \hline 106 \end{array}$$

17. $r^2 = a^2 + b^2 - 2ab\cos R$

$r = \sqrt{5^2 + 11^2 - 2(5)(11)\cos 106^\circ}$

$\boxed{r = 13.28}$

18. $b^2 = a^2 + r^2 - 2ar\cos B$

$11^2 = 5^2 + 13.28^2 - 2(5)(13.28)\cos B$

$-5^2 \quad -5^2 \quad -13.28^2$

-13.28^2

$\frac{-80.3584}{-132.8} = \frac{-132.8\cos B}{-132.8}$

$\frac{80.3584}{132.8} = \cos B$

$B = \cos^{-1}\left(\frac{80.3584}{132.8}\right)$

$\boxed{B = 52.76^\circ}$

19. $\left\langle \frac{3}{4}\cos 315^\circ, \frac{3}{4}\sin 315^\circ \right\rangle = \left\langle \frac{3}{4}\cdot\frac{\sqrt{2}}{2}, \frac{3}{4}\cdot\frac{-\sqrt{2}}{2} \right\rangle$

$= \boxed{\left\langle \frac{3\sqrt{2}}{8}, \frac{-3\sqrt{2}}{8} \right\rangle}$

20. $8\cos\frac{5\pi}{6}i + 8\cos\frac{5\pi}{6}j = 8\left(\frac{-\sqrt{3}}{2}\right)i + 8\left(\frac{1}{2}\right)j$

$-4\sqrt{3}i + 4j = \boxed{\langle -4\sqrt{3}, 4 \rangle}$

21. 

$\sqrt{4^2+4^2}$

$\sqrt{16+16}$

$\sqrt{32}$

$4\sqrt{2}$

$\tan\theta = \frac{4}{4}$

$\theta = \tan^{-1}(1)$

$\theta = \frac{\pi}{4}$

$r\langle\cos\theta, \sin\theta\rangle$

$\boxed{4\sqrt{2}\left\langle\cos\frac{\pi}{4}, \sin\frac{\pi}{4}\right\rangle}$

22. $3\cos 35°\, i + 3\sin 35°\, j$

$+ -4\cos 175°\, i + -4\sin 175°\, j$

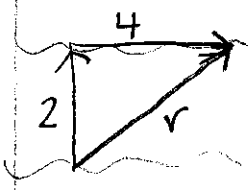
$\boxed{6.44\, i + 1.37\, j}$

23. $\langle -2, 5\rangle \rightarrow$ unit vector (length 1) $\rightarrow \frac{\langle -2,5\rangle}{\sqrt{(-2)^2+5^2}} = \frac{\langle -2,5\rangle}{\sqrt{4+25}}$

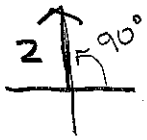
$= \frac{\langle -2,5\rangle}{\sqrt{29}} = \left\langle \frac{-2}{\sqrt{29}}, \frac{5}{\sqrt{29}} \right\rangle$

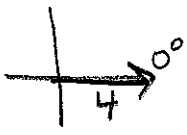
$= \left\langle \frac{-2\sqrt{29}}{29}, \frac{5\sqrt{29}}{29} \right\rangle.$

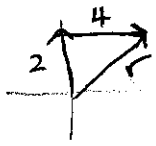
magnitude 6 $\rightarrow$ (length 6) $6\left\langle \frac{-2\sqrt{29}}{29}, \frac{5\sqrt{29}}{29} \right\rangle = \boxed{\left\langle \frac{-12\sqrt{29}}{29}, \frac{30\sqrt{29}}{29} \right\rangle}$

24. 

or







$2\langle\cos 90°, \sin 90°\rangle = 2\langle 0, 1\rangle$

$+ 4\langle\cos 0°, \sin 0°\rangle = 4\langle 1, 0\rangle$

$\langle 0, 2\rangle$

$+\langle 4, 0\rangle$

$\langle 4, 2\rangle$

magnitude $= \sqrt{4^2+2^2}$

$\sqrt{20}$

$\sqrt{4.47}$ km/hr