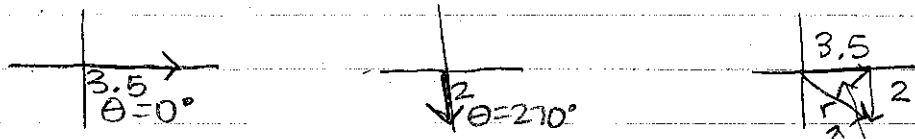


1.



$$r = 3.5 \langle \cos 0^\circ, \sin 0^\circ \rangle + 2 \langle \cos 270^\circ, \sin 270^\circ \rangle$$

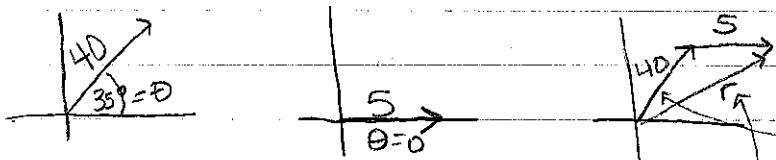
$$r = \langle 3.5, -2 \rangle \quad \text{makes sense } \downarrow$$

$$\|r\| = \sqrt{3.5^2 + (-2)^2} = 4.03 \text{ ft/sec} \quad \textcircled{a}$$

$$\theta = \tan^{-1}\left(\frac{-2}{3.5}\right) = -29.74^\circ \quad \text{makes sense } \downarrow$$

$$\boxed{E 29.74^\circ S} \quad \textcircled{b}$$

2.



$$r = 40 \langle \cos 35^\circ, \sin 35^\circ \rangle + 5 \langle \cos 0^\circ, \sin 0^\circ \rangle$$

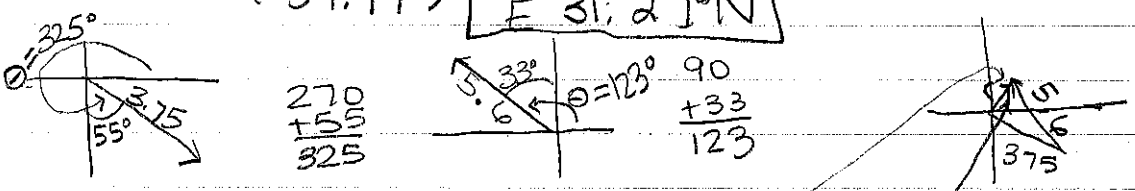
$$r = \langle 37.77, 22.94 \rangle \quad \text{makes sense } \downarrow$$

$$\|r\| = \sqrt{37.77^2 + 22.94^2} = 44.19 \text{ mph}$$

$$\theta = \tan^{-1}\left(\frac{22.94}{37.77}\right) = 31.27^\circ \quad \text{makes sense } \downarrow$$

$$\boxed{E 31.27^\circ N}$$

3.



$$r = 3.75 \langle \cos 325^\circ, \sin 325^\circ \rangle + 5.6 \langle \cos 123^\circ, \sin 123^\circ \rangle$$

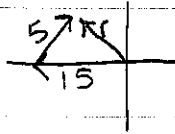
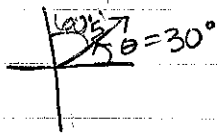
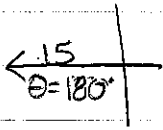
$$r = \langle .02, 2.55 \rangle \quad \text{makes sense } \downarrow$$

$$\|r\| = \sqrt{.02^2 + 2.55^2} = 2.55 \text{ km}$$

$$\theta = \tan^{-1}\left(\frac{2.55}{.02}\right) = 89.55^\circ$$

$$\boxed{E 89.55^\circ N}$$

4.



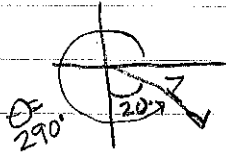
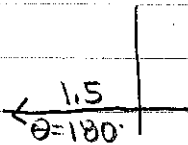
$$15 \langle \cos 180^\circ, \sin 180^\circ \rangle$$

$$5 \langle \cos 30^\circ, \sin 30^\circ \rangle$$

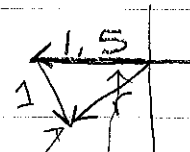
$$r = \langle -10.67, 2.5 \rangle$$

$$\|r\| = \sqrt{(-10.67)^2 + (2.5)^2} = 10.96 \text{ mph}$$

5.



$$\begin{array}{r} 270 \\ +20 \\ \hline 290 \end{array}$$



$$r = 1.5 \langle \cos 180^\circ, \sin 180^\circ \rangle$$

$$1 \langle \cos 290^\circ, \sin 290^\circ \rangle$$

$$r = \langle -1.16, -.94 \rangle$$

$$\|r\| = \sqrt{(-1.16)^2 + (-.94)^2} = 1.49 \text{ mps}$$

makes sense!

$$\theta = \tan^{-1}\left(\frac{-.94}{-1.16}\right) = \tan^{-1}\left(\frac{.94}{1.16}\right) = 39.02^\circ \text{ makes sense!}$$

$$\boxed{\text{W } 39.02^\circ \text{ S}}$$