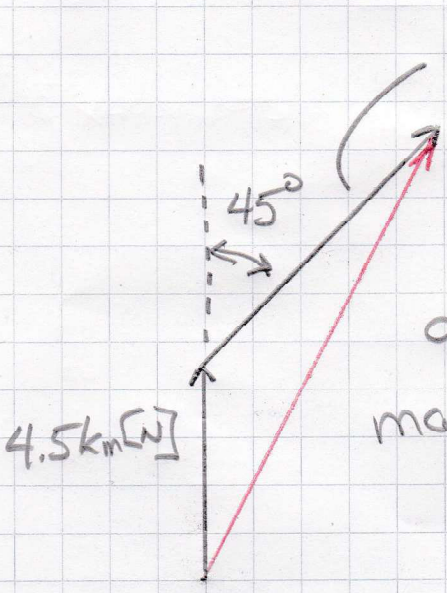
VECTOR WORKSHEET

9.

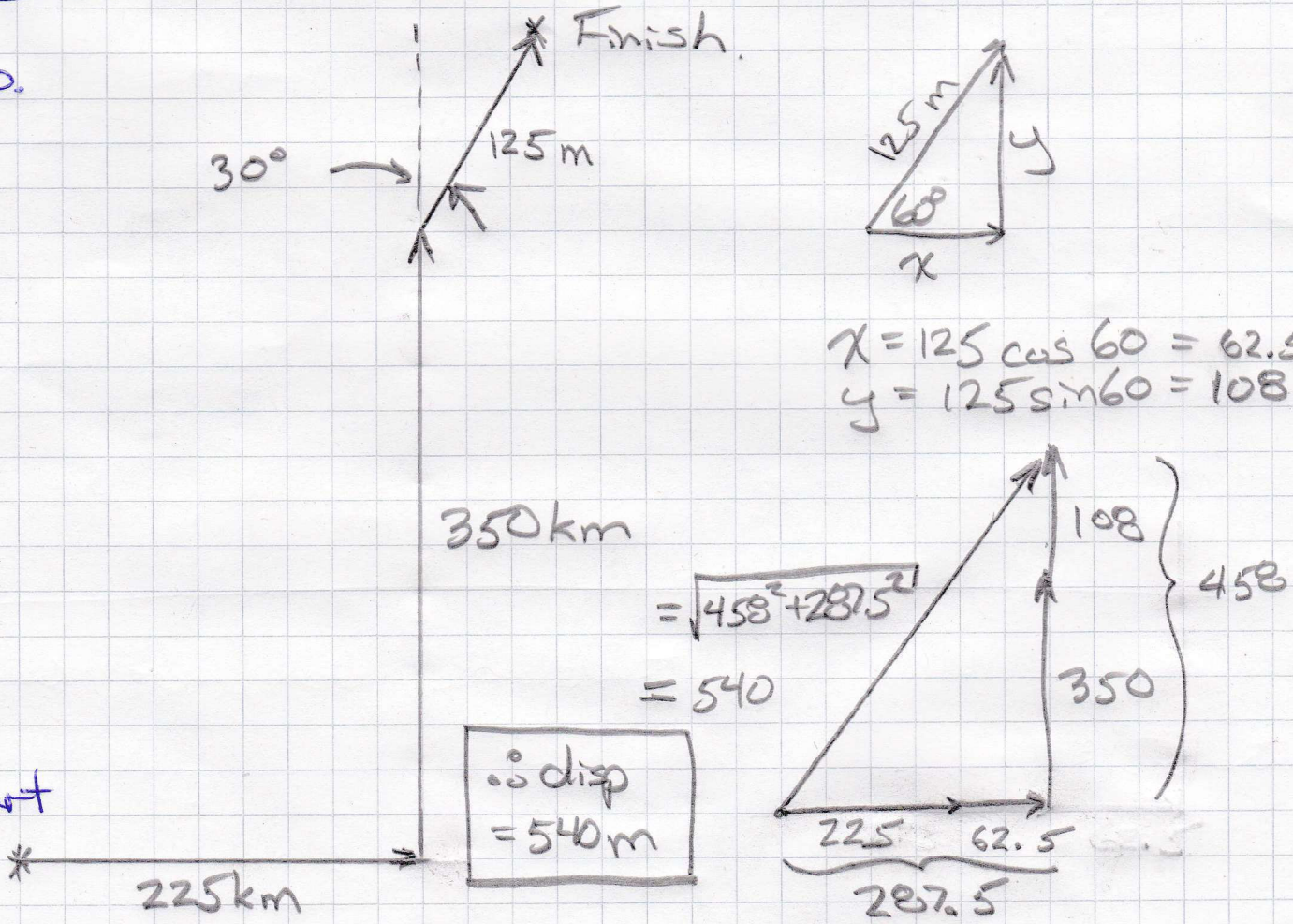


displacement

magnitude $= \sqrt{4.5^2 + 6.4^2 - 2(4.5)(6.4)(\cos 135)}$

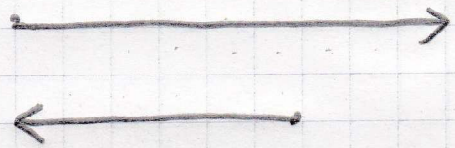
$= 10.1$ km

10.



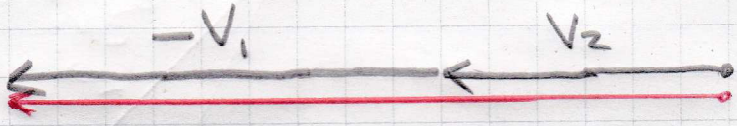
11. $V_1 = 45\ km/hr\ [E]$

$V_2 = 30\ km/hr\ [W]$



change in velocity = ΔV

$\Delta V = V_2 - V_1$



$V_2 - V_1 = 30\ km/hr\ [W] - 45\ km/hr\ [E]$

$= 30\ km/hr\ [W] + 45\ km/hr\ [W]$

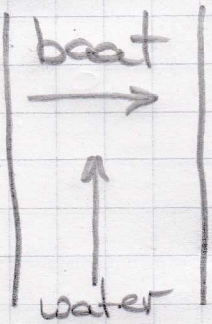
$= 75\ km/hr\ [W]$.

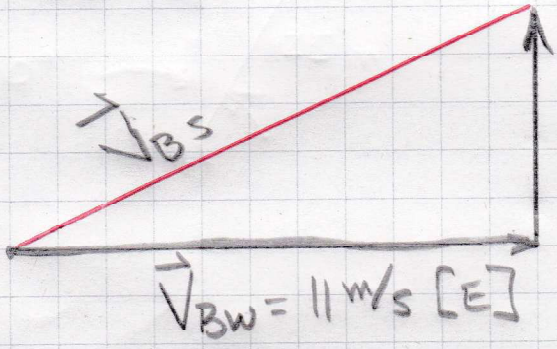
#12.

$\vec{V}_{BW} = 11\ m/s\ [E]$ boat wrt water

$\vec{V}_{WS} = 5.0\ m/s\ [N]$ water wrt shore

$\vec{V}_{BS} = ?$ boat wrt shore.





$\vec{V}_{BS} = \vec{V}_{BW} + \vec{V}_{WS}$

$= 12\ m/s\ [E\ 24°\ N]$.

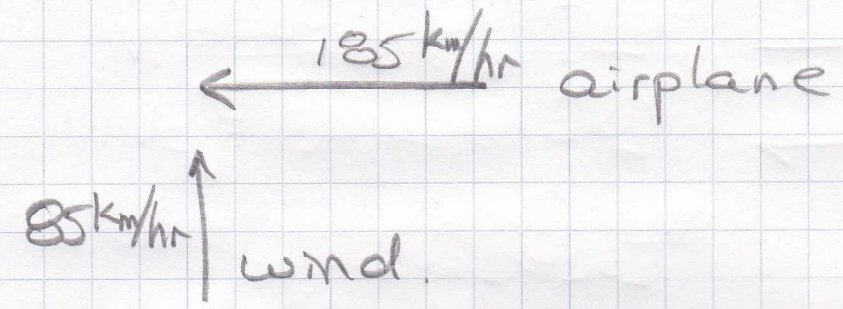
$\sqrt{5^2 + 11^2}$

$= 12\ m/s$

$\theta = \tan^{-1}\left(\frac{5}{11}\right)$

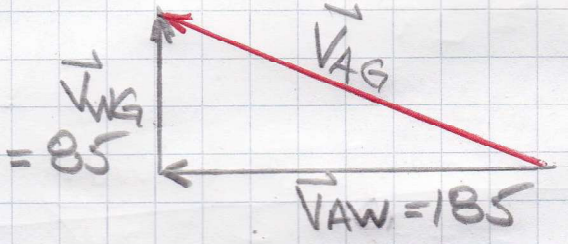
$= 24°$

13.



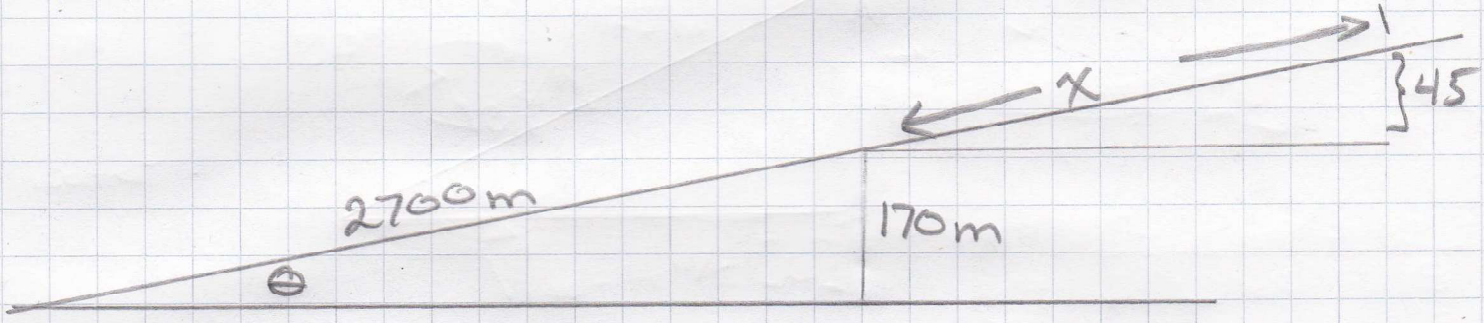
$\vec{V}_{AG} = \vec{V}_{AW} + \vec{V}_{WG}$

- $\vec{V}_{AG}$: airplane wrt ground
- $\vec{V}_{AW}$: airplane wrt wind
- $\vec{V}_{WG}$: wind wrt ground



$\vec{V}_{AG} = 204\ km/hr\ [W25°N]$

14.



a. $\sin\theta = \frac{170}{2700} \Rightarrow \theta = \sin^{-1}\left(\frac{170}{2700}\right)$

$= 3.6°$

b. $\sin\theta = \frac{45}{x} \Rightarrow x = 45 / \sin 3.6°$

$= 715\ m$