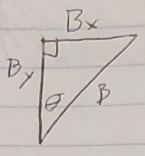
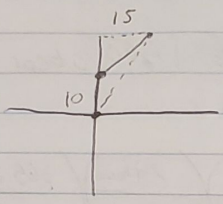
PHYS 407



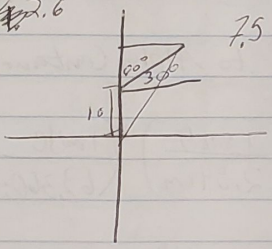
$\theta = 60°$

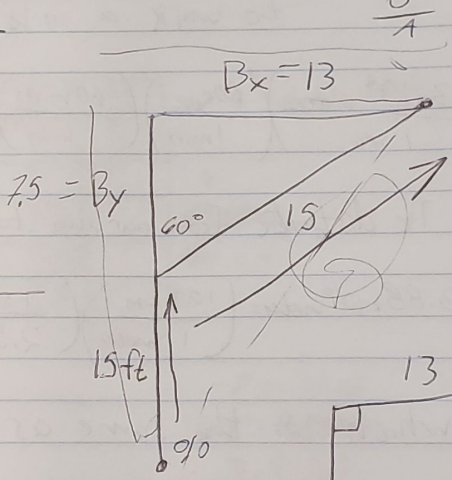
$B_y = B\cos 60$

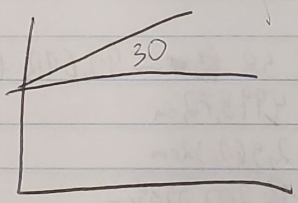
$B_x = B\sin 60$

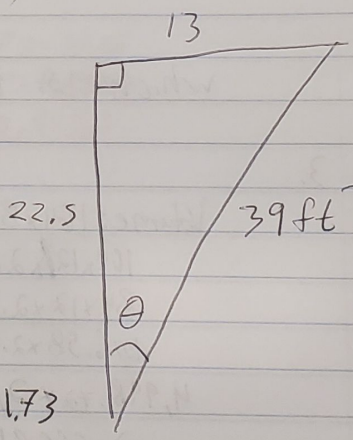


2.6



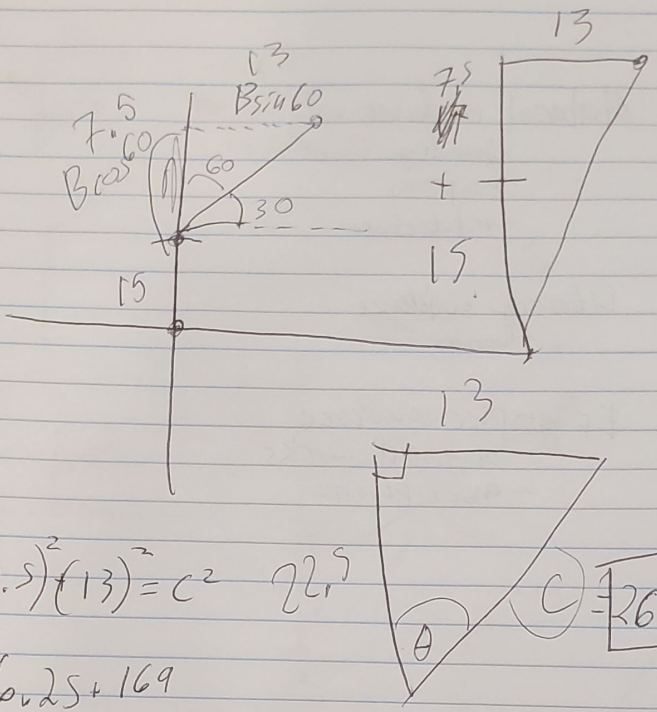






$\frac{22.5}{13} = 1.73$

PHYS 407



$(22.5)^2 + (13)^2 = c^2$

$506.25 + 169$

2.8

$B \sin 60 = B_x = 13$

$B \cos 60 = B_y = 7.5$

$A_y = 15$

$y = B_y + A_y = 22.5$

$x = B_x = 13$

$c = 26$

$c^2 = x^2 + y^2$

2.9

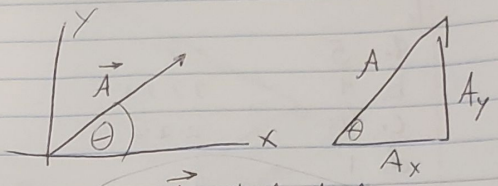
north east

PHYS 407

2.10

$A_x = \vec{A}\sin\theta$

$A_y = \vec{A}\cos\theta$

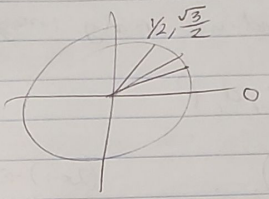


$\vec{A} = A_x\hat{x} + A_y\hat{y}$

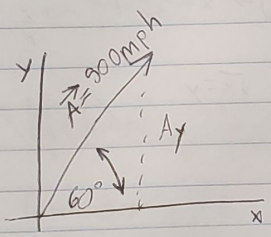
2.11

$A_x = \vec{A}\sin\psi$

$A_y = \vec{A}\cos\psi$

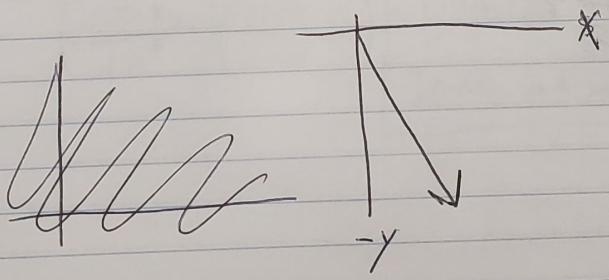


2.12



$\vec{v} = 250\hat{x} + 433\hat{y}$ + units

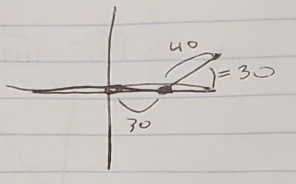
2.13

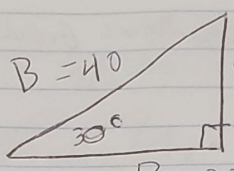


$\vec{V} = 250\text{mph}\,\hat{x} - 433\text{mph}\,\hat{y}$

PHYS 407

2.14

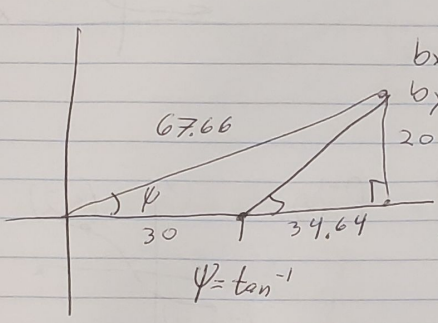




$b_x = B \cos 30$

$b_x = 34.64$

$b_y = 20$



$\psi = \tan^{-1}$

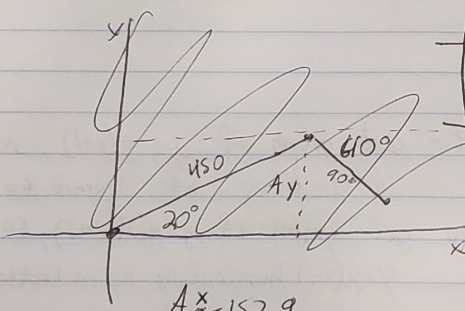
Pythag.

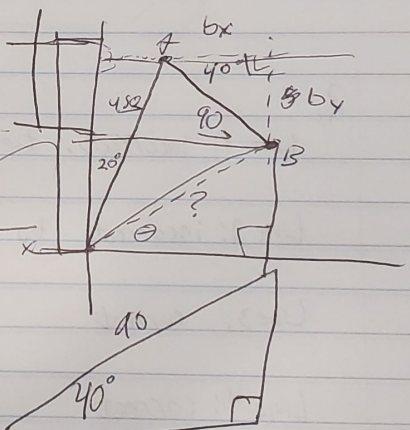
$c^2 = 4578.33$

$c = 67.66$

He should go 67.66 ft, 17.2° south of west

2.15





$A_x = 153.9$

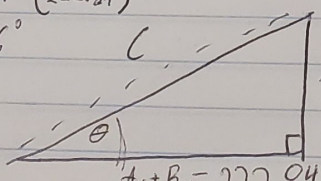
$A_y = 422.86$

$B_x = 68.94$

$B_y = -57.85$

$\theta = \tan^{-1}\left(\frac{365.01}{222.84}\right)$

$\theta = 58.6°$



$A_y + B_y = 365.01$

$A_x + B_x = 222.84$

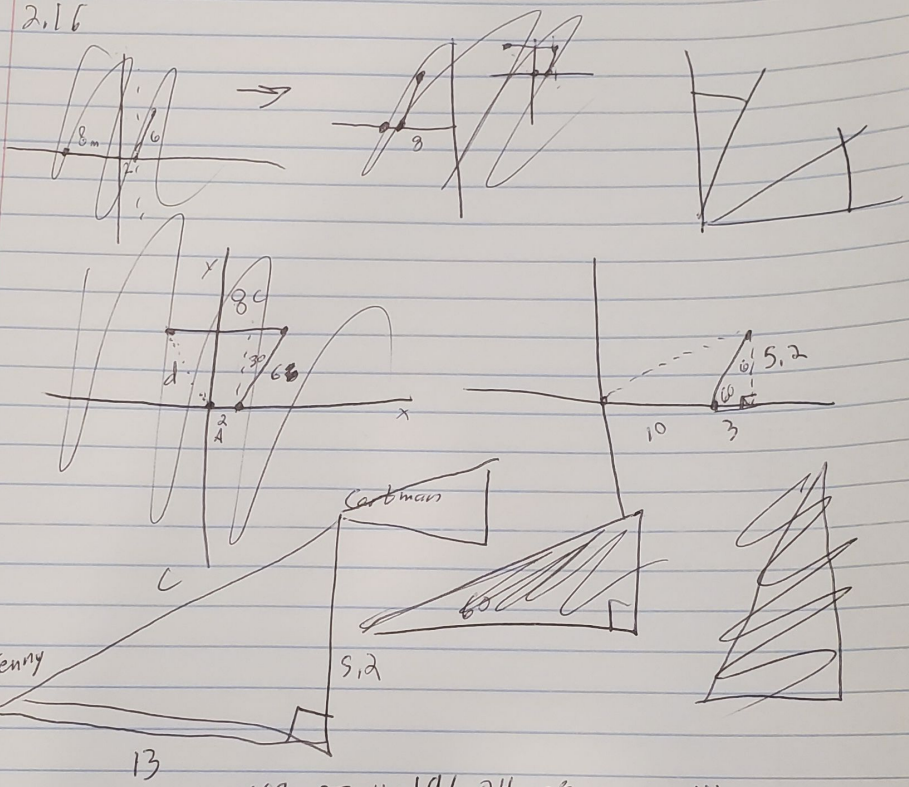
$c^2 = 182884$

$C = 427.66$

Airliner is flying 427.66 mph 31.4° east of north

PhYS 407

2.16



$169 + 27.04 = 196.04 = c^2$ $\quad c = 14$

they are 14 meters

2.17

$$\tan^{-1}\left(\frac{5.2}{13}\right) = \theta = 21.8°$$

21.8° south of west