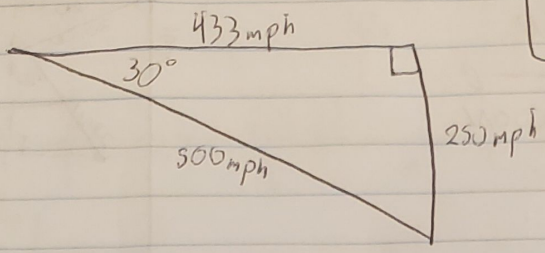
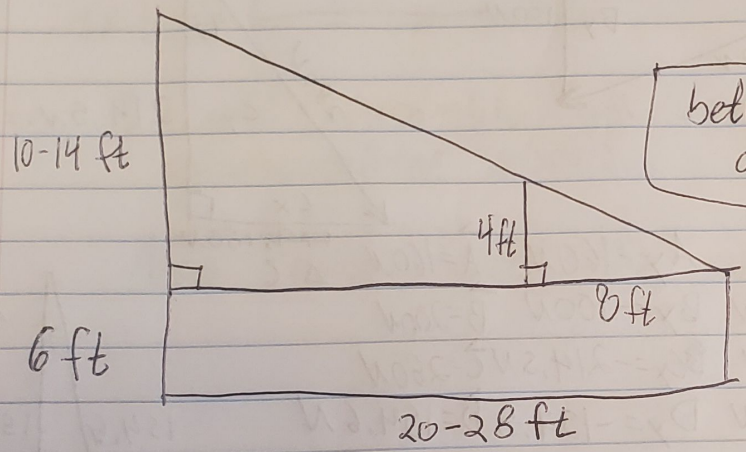
PHYS 407

1.



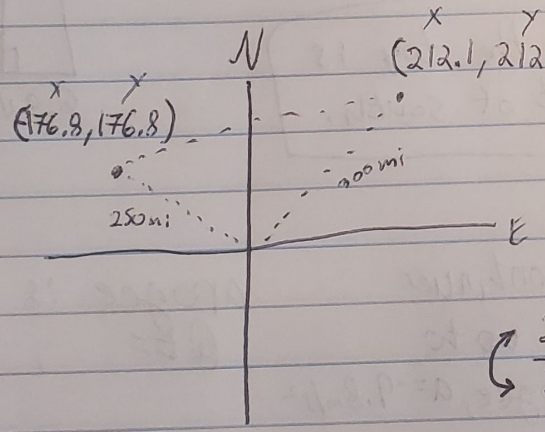
$\vec{v} = (433\hat{x} + 250\hat{y})$ mph

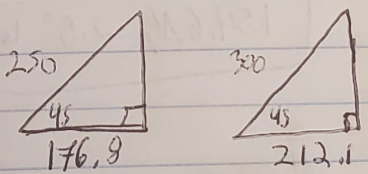
2.



between 20 ft and 28 ft away

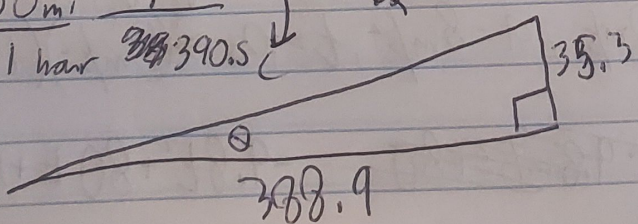
3.





$$\frac{212.1 + 176.8}{212.1 - 176.8} = \frac{388.9}{35.3} \rightarrow \frac{35.3}{388.9}$$

$$\frac{250\text{ mi}}{1\text{ hour}} \quad \frac{?}{390.5}$$



$\theta = 5.2°$

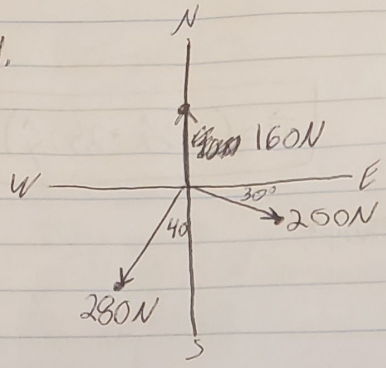
$c^2 = 152489.3$

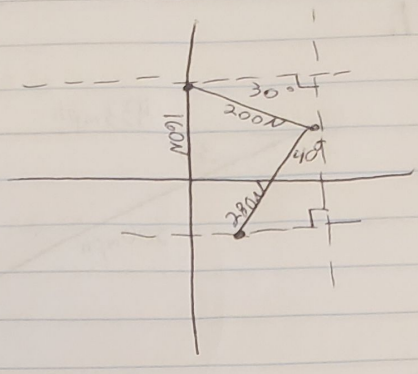
$c = 390.5$ mi/hr

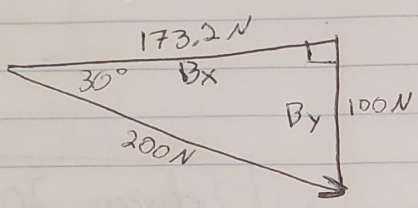
Fly for 99 minutes at a heading 5.2° north of east

PHYS 407

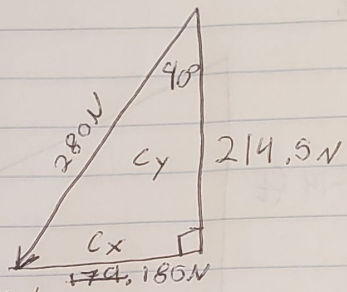
4.







ΔB



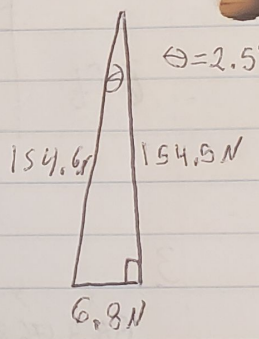
Δ C

$A_x = 0N$ $A_y = 160N$ $\vec{A} = 160N$

$B_x = 173.2N$ $B_y = -100N$ $\vec{B} = 200N$

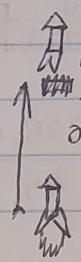
$C_x = -180N$ $C_y = -214.5N$ $\vec{C} = 280N$

$D_x = -6.8N$ $D_y = -154.5$ $\vec{D} = 154.6N$



The net force on the toy is 154.6N, 2.5° west of south.

5.



rocket continues to coast up to apogee, $a = -9.8 m/s^2$

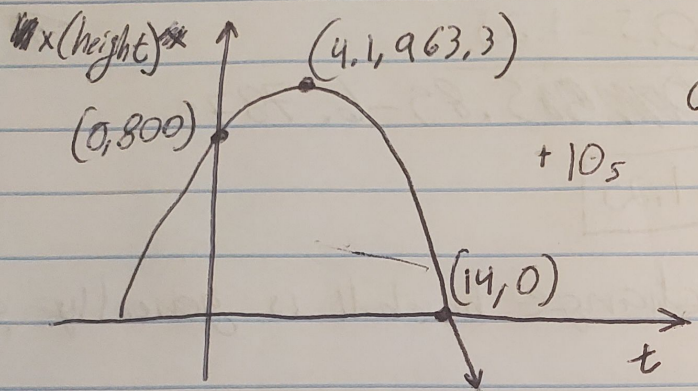
apogee is reached @ t= , m

$V_f = V_i + at$

$V_i = 0 m/s$, $a = 8 m/s^2$, $t = 10s \Rightarrow (8 m/s^2)(10s) = 80 m/s$

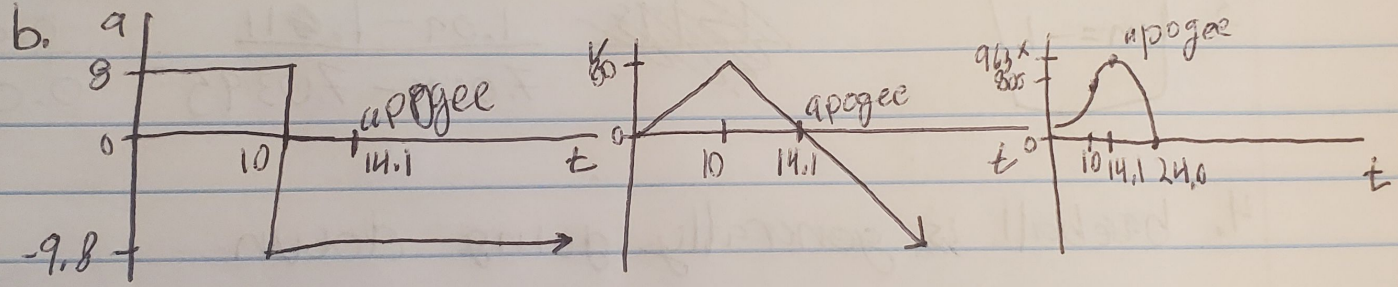
$h_{apogee} = -9.8t^2 + 80t + 800$

PHYS 407



a. apogee is reached 14.1 seconds after rocket ignition at a height of 963.3m above the launch pad.

b.



6. I could probably use more help with calculus-related stuff.

Also radio waves are interesting to me.