1. $\frac{66.500 \text{ miles}}{\text{hour}} \times \frac{1.609 \text{ km}}{1 \text{ mile}} \times \frac{1000 \text{ m}}{1 \text{ km}}$

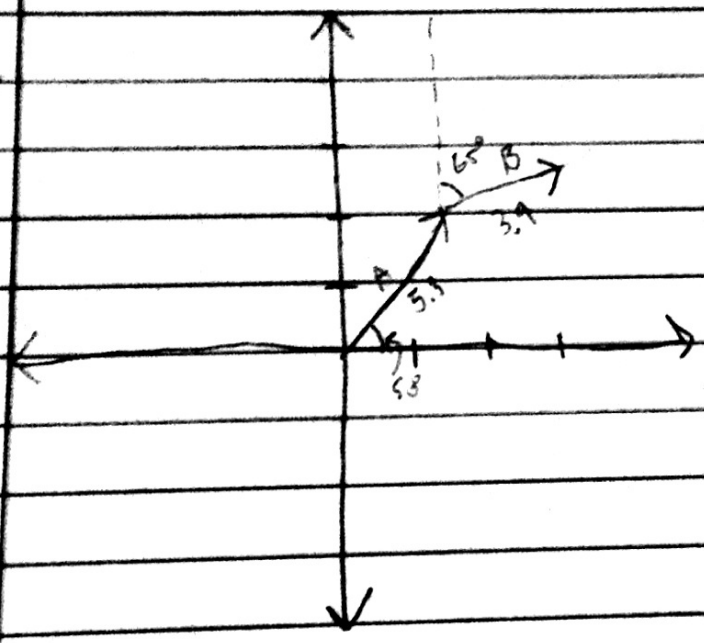
$106998.5 \frac{\text{km}}{\text{h}}$ $\quad 106998500 \frac{\text{m}}{\text{h}}$

$\frac{106998500 \text{ m}}{1 \text{ hour}} \times \frac{1 \text{ hour}}{60 \text{ minutes}} \times \frac{1 \text{ minute}}{60 \text{ sec}}$

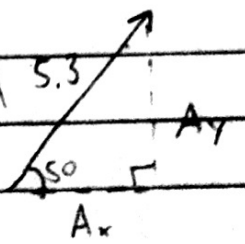
$1783308.333 \frac{\text{m}}{\text{min}}$ $\quad 29721.806 \frac{\text{m}}{\text{s}}$

2.97×10^{4} meters

2.



SOH CAH TOA



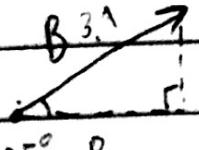
$\sin(50^\circ) = \frac{A_y}{5.3}$

$5.3\sin(50^\circ) = A_y$

$A_y = 4.06$

$\cos(50) = \frac{A_x}{5.3}$

$5.3\cos(50) = A_x = 3.41$



$\sin(25^\circ) = \frac{B_y}{3.9}$

$3.9\sin(25^\circ) = B_y$

$B_y = 1.65$

$\cos(25^\circ) = \frac{B_x}{3.9}$

$3.9\cos(25^\circ) = B_x$

$B_x = 3.53$

$A_x + B_x = C_x$

$3.41 + 3.53 = 6.94$

$A_y + B_y = C_y$

$4.06 + 1.65 = 5.71$

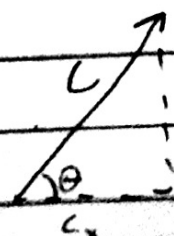
$C_x^2 + C_y^2 = C^2$

$C = \sqrt{C_x^2 + C_y^2}$

$C = \sqrt{6.94^2 + 5.71^2}$

$= \sqrt{48.2 + 32.6}$

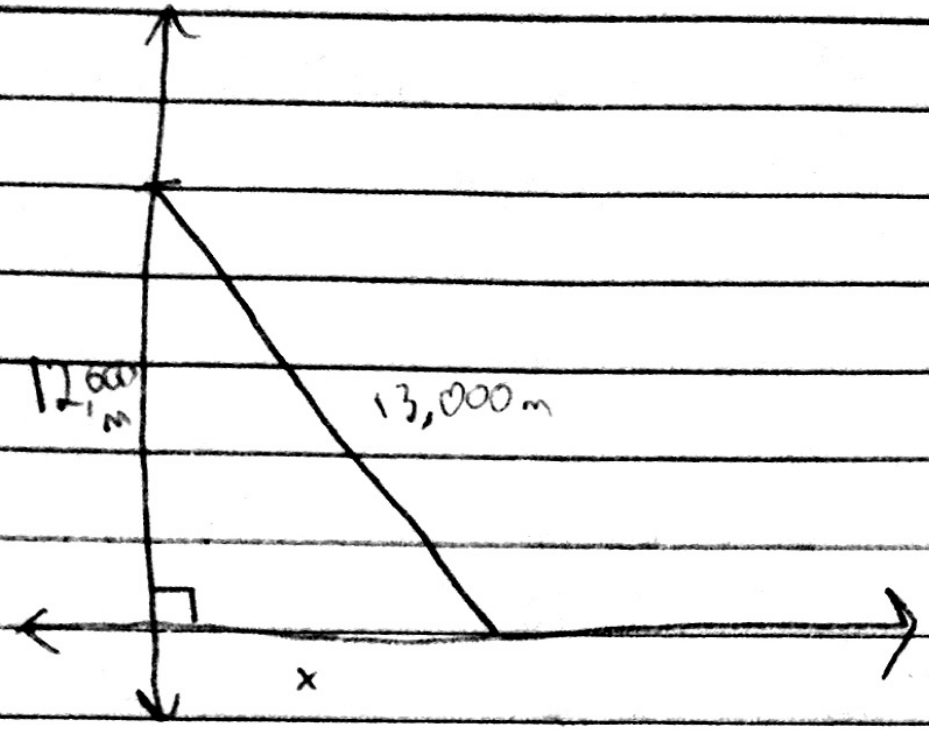
$C = 8.99$



$\sin(\theta) = \frac{C_y}{C} = 0.64$ $\quad \sin^{-1}(0.64) = \theta$

39.8°

3.



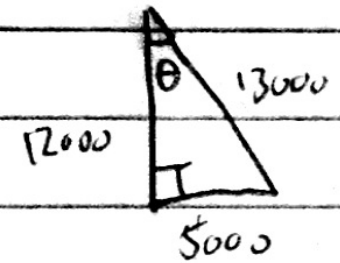
$12{,}000^2 + x^2 = 13000^2$

$x^2 = 13000^2 - 12000^2$

$x = \sqrt{13000^2 - 12000^2}$

$x = \sqrt{25000000}$

$\boxed{x = 5000\ m}$



$\sin(\theta) = \frac{5000}{13000}$

$\sin(\theta) = 5/13$

$\sin^{-1}(5/13) = \theta$

$\boxed{22.62^\circ \text{ South to East}}$