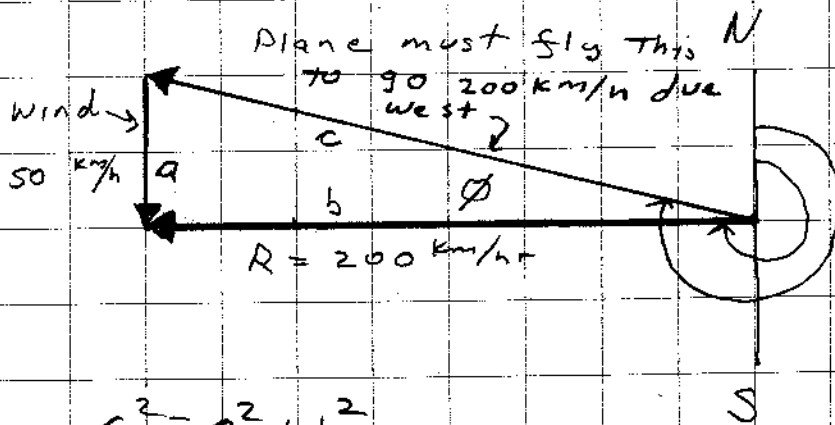


200801160915 Sample Problem

Find velocity plane must fly to go 200 km/h due west if wind is 50 $\frac{\text{km}}{\text{h}}$ from the North.



$$\tan \phi = \frac{\text{OPP}}{\text{ADJ}}$$

$$\tan \phi = \frac{50 \frac{\text{km}}{\text{h}}}{200 \frac{\text{km}}{\text{h}}}$$

$$\tan \phi = \frac{1}{4}$$

$$\tan \phi = .25$$

$$\phi = \tan^{-1}(.25)$$

$$\phi = 14.04^\circ$$

$$c^2 = a^2 + b^2$$

$$= (50 \frac{\text{km}}{\text{h}})^2 + (200 \frac{\text{km}}{\text{h}})^2$$

$$= 2500 \frac{\text{km}^2}{\text{h}^2} + 40000 \frac{\text{km}^2}{\text{h}^2}$$

$$= 42500 \frac{\text{km}^2}{\text{h}^2}$$

$$c = \sqrt{42500 \frac{\text{km}^2}{\text{h}^2}}$$

$$= \sqrt{100} \sqrt{25} \sqrt{17} \frac{\text{km}}{\text{h}}$$

$$= (10)(5) \sqrt{17} \frac{\text{km}}{\text{h}}$$

$$c = 50 \sqrt{17} \frac{\text{km}}{\text{h}}$$

$$c = 206.2 \frac{\text{km}}{\text{h}}$$

\therefore The pilot must fly the plane at 206 km/hour on a heading of 284° as measured from North in a clockwise direction.