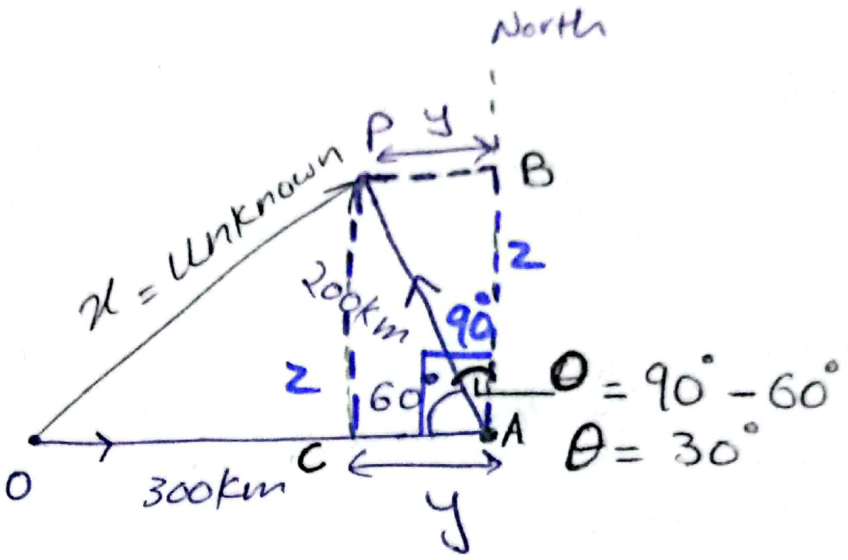
Q: An automobile travels 300km due to East and then 200km 60° North of East. Find resultant.



From right angled triangle ABP:

Finding base AB and Perpendicular BP

$\cos\theta = \text{base}/\text{hypotenuse}$

$\cos\theta = \frac{AB}{AP} \Rightarrow AB = (\cos 30^\circ) * AP$

since $AP = 200km$

$\cos 30^\circ = \frac{\sqrt{3}}{2}$

↳ AP is hypotenuse

$AB = 173.21\ km$

$\Rightarrow \boxed{z = 173.21km}$

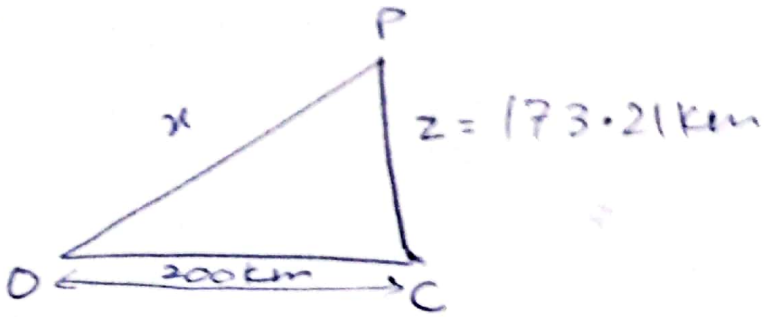
For finding Perpendicular of right angled triangle ABP

$\sin\theta = \frac{BP}{AP} \Rightarrow AP * \sin\theta = BP$

$BP = 200km * \frac{1}{2} = 100km$

$\boxed{y = 100km}$

For finding x :



$OC = OA - AC = 300\text{km} - y = 300\text{km} - 100\text{km}$

$Oc = 200\text{km}$

Using Pythagoras Theorem

$(\text{hypotenuse})^2 = (\text{base})^2 + (\text{perpendicular})^2$

$(x)^2 = (200)^2 + (173.21)^2$

$= 40000 + 30001.7041$

$x^2 = 70001.7041$

Taking square root on both sides

$$\boxed{x = 264.58\text{ km}}$$