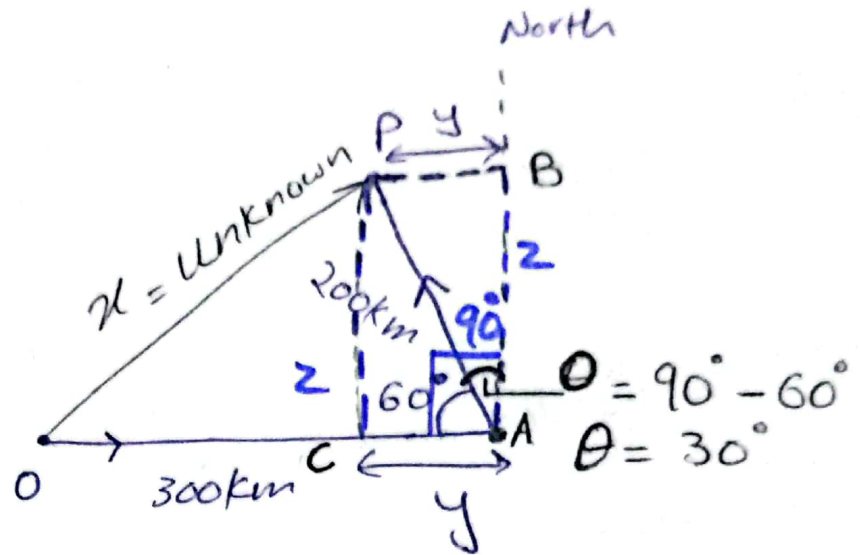


Q: An automobile travels 300km due to East and then 200km 60° North of East. Find resultant.



From right angled triangle ABP:

Finding base AB and Perpendicular BP

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

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

Since $AP = 200\text{km}$

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

AP is hypotenuse

$$AB = 173.21 \text{ km}$$

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

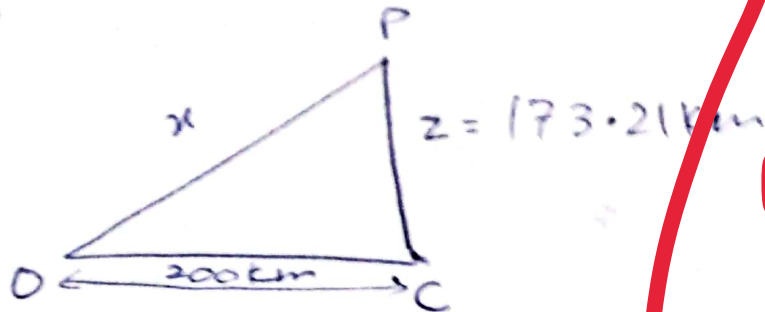
For finding Perpendicular of right angled triangle ABP

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

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

$$\boxed{y = 100 \text{ km}}$$

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

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

