

Navigation

A) An airplane is flying on a bearing of 135° at 435 mph. Find the component form of the velocity of the airplane.

$$\text{plane} = \langle 435 \cos 135, 435 \sin 135 \rangle$$

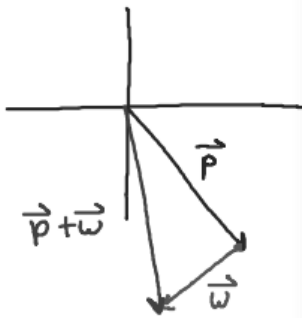
B) An airplane is flying on a compass heading (bearing) of 315° at 300 mph. A wind is blowing with the bearing 220° at 30 mph.

- Find the component form of the velocity of the airplane.

$$\text{plane} = \langle 300 \cos 315, 300 \sin 315 \rangle$$

- Find the component form of the velocity of the wind.

$$\text{wind} = \langle 30 \cos 220, 30 \sin 220 \rangle$$



- Find the actual ground speed and direction of the airplane

$$\vec{p} = \langle 300 \cos 315, 300 \sin 315 \rangle$$

$$\vec{w} = \langle 30 \cos 220, 30 \sin 220 \rangle$$

$$\vec{p} + \vec{w} = \langle 300 \cos 315 + 30 \cos 220, 300 \sin 315 + 30 \sin 220 \rangle$$

$$\langle 189.15, -231.41 \rangle$$

$$m_{\text{us}} = \sqrt{(189.15)^2 + (-231.41)^2}$$

$$= 298.88 \text{ mph}$$

$$\tan^{-1} \left(\frac{-231.41}{189.15} \right) = \theta$$

$$\theta = -50.7 = 309.26^\circ$$