Answer on Question #38795, Physics, Mechanics | Kinematics | Dynamics

Question:

What is the resultant speed of an airplane headed due south at a speed of 500 km/hr while being subjected to a 100 km/hr wind coming from the northeast?

Answer:

South direction component equals:

$$v_s = 500\frac{km}{h} + 100 * \cos 45° \frac{km}{h} = 570.7\frac{km}{h}$$

West direction component equals:

$$v_w = 100 * \sin 45° \frac{km}{h} = 70.7\frac{km}{h}$$

Therefore resultant speed of an airplane equals:

$$v = \sqrt{v_s^2 + v_w^2} = 575\ \frac{km}{h}$$

Answer: $575\ \frac{km}{h}$