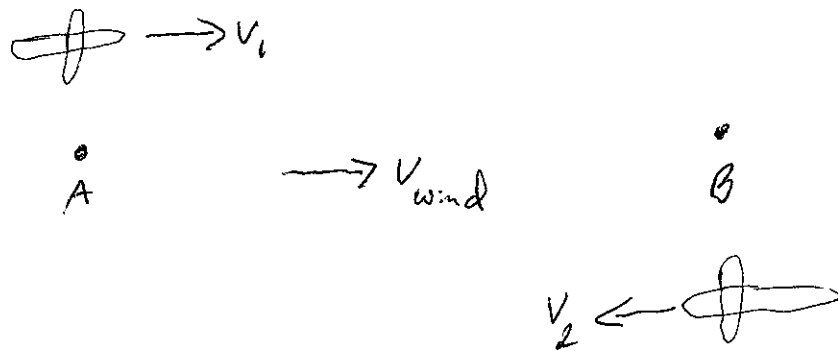


①

A plane ride takes 1.5 hours to travel 1.4 E 3 km. If the same path is taken on the return trip the time elapsed is 1.7 hours. What is the wind speed, assuming it is constant for both trips?



Part 1: with wind

$$V_1 = V_{PG} = V_{PA} + V_{AG}$$

\uparrow \uparrow \uparrow
 Plane to Plane to air to
 ground air ground

$$\Delta x = 1.4 \times 10^6 \text{ m}$$

$$\Delta t_1 = 1.5 \text{ hr} \frac{3600 \text{ s}}{\text{hr}} = 5400 \text{ s}$$

(2)

$$V_1 = \frac{1.4 \text{E}6 \text{m}}{54005} = 259.3 \text{ m/s}$$

Part 2 : against wind

↙ opposite direction of part 1
↘ opposite direction of part 1

$$V_2 = -V_{PG} = -V_{PA} + V_{AG}$$

↑ ↑
 Plane to air to ground
 air

$$\Delta x = 1.4 \text{E}6 \text{m}$$

$$\Delta t = 1.7 \text{ hr} \frac{3600 \text{ s}}{1 \text{ hr}} = 6120 \text{ s}$$

$$V_2 = - \frac{1.4 \text{E}6 \text{m}}{6120 \text{ s}} = -228.8 \text{ m/s}$$

$$V_1 = V_{PA} + V_{AG}$$

$$V_2 = -V_{PA} + V_{AG}$$

} → $V_{PA} = V_{AG} - V_2$

$$V_1 = (V_{AG} - V_2) + V_{AG}$$
$$= 2V_{AG} - V_2$$

$$V_1 + V_2 = 2V_{AG}$$

$$\frac{V_1 + V_2}{2} = V_{AG}$$

$$\frac{259.3 \text{ m/s} + (-228.8 \text{ m/s})}{2} = 15.3 \text{ m/s}$$

$V_{wind} = 15 \text{ m/s}$