

Answer on Question#50280 - Math - Algebra

Two airplanes pass each other in flight while travelling in opposite directions. Each airplane continues on its flight for 45 minutes, after which time the airplanes are 840 km apart. The speed of the first airplane is $\frac{3}{4}$ of the speed of the other airplane. Calculate the average speed of each plane.

Solution

Let the speed of the first airplane is x km/h, then the speed of the second one is $0.75x$ km/h. As the airplanes travel in opposite directions, the distance between them increases with the speed $(0.75x + x)$ km/h. After 45 minutes ($\frac{3}{4}$ or 0.75 of hour) the distance between them is $(0.75x + x) \cdot 0.75$ km, which equals to 840 km.

Thus, we have to solve the following equation:

$$(0.75x + x) \cdot 0.75 = 840$$

$$1.75x \cdot 0.75 = 840$$

$$1.3125x = 840$$

$$x = 640$$

Thus, the average speed of the first plane is 640 km/h, and the speed of the second plane is $640 \cdot 0.75 = 480$ km/h.