Answer on Question #54677, Physics Mechanics – Kinematics - Dynamics

Runner A is initially 7.0 mi west of a flagpole and is running with a constant velocity of 5.0 mi/h due east. Runner B is initially 2.0 mi east of the flagpole and is running with a constant velocity of 4.0 mi/h due west. How far are the runners from the flagpole when they meet?

Solution

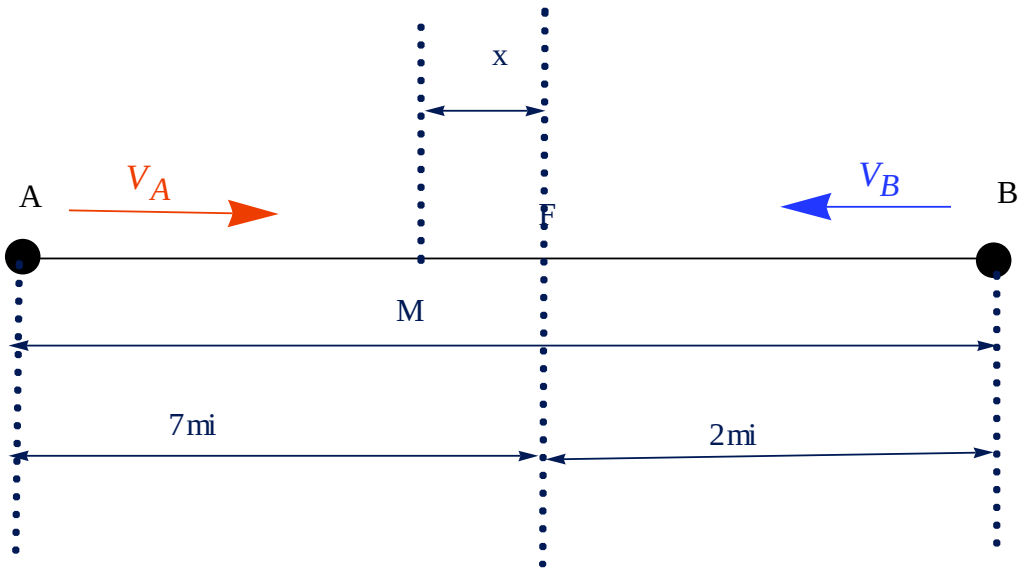

Fig.1

The time from start to meetings (see Fig.1)

$$t = \frac{AB}{V_A + V_B} = \frac{7mi + 2mi}{5mi/h + 4mi/h} = 1h \quad (1)$$

where AB is the distance between runners; V_A, V_B are the speeds of runners.

Distance from the flagpole to the meeting place

$$x = 7mi - V_A \cdot t = 7mi - 5mi/h \cdot 1h = 2mi \quad (2)$$

Answer: $x = 2mi$