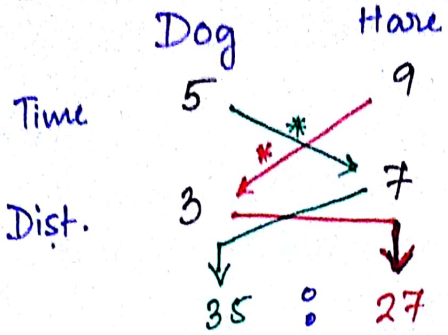
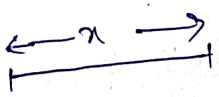
$\therefore \frac{5x}{3} : \frac{9x}{7} = 35 : 27.$

Shortcut way :



2. A man observed, if he moves with a speed of 40k/h He will be late by 15 min. But if he can move with a speed of 60 km/h, he will be earlier by 20 min. What dist. he have to cover? What will be the optimum speed so that the man can reach the dist. in scheduled time?

— **Normal Method :** Let us consider the man has to cover x dist.



$15 \text{ min} = \frac{15}{60} = \frac{1}{4}$ hour.

$30 \text{ min} = \frac{30}{60} = \frac{1}{2}$ hour

If he moves with a speed of 40 k/h and late by 15 min

$\therefore$ schedule time $= \frac{x}{40} - \frac{1}{4}$

If he moves with speed 60k/h, early by 20 min.

$\therefore$ scheduled time $= \frac{x}{60} + \frac{1}{3}$

$\therefore \frac{x}{40} - \frac{1}{4} = \frac{x}{60} + \frac{1}{3}$

$\therefore x = \frac{1/4 + 1/3}{1/40 - 1/60}$

Shortcut : $\text{Distance} = \frac{\text{Late Hours} + \text{Early hours}}{\frac{1}{\text{Late velocity}} - \frac{1}{\text{early velocity}}}$

40K — 15m → 1/4

60K — 20m → 1/3

$= \frac{1/4 + 1/3}{1/40 - 1/60}$

$= 70$ m.

Optimum speed = 40 (15 min) = 8 km/h.