3. A train 1200m long moving with a speed 40m/sec. Another train which is 200m ahead from first train 800m long moving in a same direction with a speed of 20 m/s. Find out what time is requaired to cros the 2nd train by 1st train.

(from rule 3)

$$40 - 20 = \frac{1200 + 200 + 800}{t}$$

$$20 = \frac{2200}{t}$$

or, $t = 110$ s.

4. A boy went to his school with a speed of 40 km/h & return 60 km/h. What is the avg. speed of the boy.

(Rule 5)

$$\text{avg speed} = \frac{2 \times 60 \times 40}{60 + 40}$$

$$= 48 \text{ km/h}.$$

5. A boat takes 8 hours to cover 400km in downstream and takes 12 hours to cover same distance in upstream What is speed of boat in stream water & speed of stream.

(Rule - 8)

$$v = \frac{400}{2}\left(\frac{1}{12} + \frac{1}{8}\right) = \frac{125}{3}$$

$$u = \frac{400}{2}\left(\frac{1}{8} - \frac{1}{12}\right) = \frac{25}{3}.$$

6. A boat takes 4 hrs to cover certain distance in down stream and takes 5 hrs to cover same distance in upstream What is the ratio of boat in stream water to speed of stream.

(Rule - 9)

$$\frac{v}{u} = \frac{5+4}{5-4} = \frac{9}{1} = 9:1.$$