

Answer on question #60809, Physics / Classical Mechanics

Question 2 trains each of length 120 m are running on parallel tracks. One train overtakes the other in 24 seconds and one crossed the other in 12 seconds . What are the velocities of the train?

Solution When one train overtakes another then their velocities must be subtracted, when one crosses another then they must be added. In both cases, the total distance is sum of the length of both trains. Hence, the system of equation will be

$$v_1 - v_2 = \frac{2 \cdot 120}{t_o} = \frac{240}{24} = 10 \text{ m/s}$$

$$v_1 + v_2 = \frac{2 \cdot 120}{t_c} = \frac{240}{12} = 20 \text{ m/s}$$

From this we find that

$$v_1 = 15 \text{ m/s}$$

$$v_2 = 5 \text{ m/s}$$