Problems on Trains

1. *km/hr to m/s conversion:*

   a km/hr = $\left(a \times \frac{5}{18} \right)$ m/s.

2. *m/s to km/hr conversion:*

   a m/s = $\left(a \times \frac{18}{5} \right)$ km/hr.

3. Time taken by a train of length l metres to pass a pole or standing man or a signal post is equal to the time taken by the train to cover l metres.
4. Time taken by a train of length l metres to pass a stationery object of length b metres is the time taken by the train to cover $(l + b)$ metres.
5. Suppose two trains or two objects bodies are moving in the same direction at u m/s and v m/s, where $u > v$, then their relative speed is = $(u - v)$ m/s.
6. Suppose two trains or two objects bodies are moving in opposite directions at u m/s and v m/s, then their relative speed is = $(u + v)$ m/s.
7. If two trains of length a metres and b metres are moving in opposite directions at u m/s and v m/s, then:

   The time taken by the trains to cross each other = $\frac{(a + b)}{(u + v)}$ sec.

8. If two trains of length a metres and b metres are moving in the same direction at u m/s and v m/s, then:

   The time taken by the faster train to cross the slower train = $\frac{(a + b)}{(u - v)}$ sec.

9. If two trains (or bodies) start at the same time from points A and B towards each other and after crossing they take a and b sec in reaching B and A respectively, then:

   (A's speed) : (B's speed) = (b : a)