Trains

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Problem on Trains

Keep same units for all values mentioned in the problem i.e. as per the units of the given answers convert kilometre per hour (km/hr) to meters per second (m/s) and vice versa. In a similar way, convert meter (m) into centimetre (cm) and vice versa. See the examples given below:

Formula to convert Km/hr into m/s:
• 1km is equal to 1000 meters
• 1 hours is equal to 3600 seconds
• 1Km/hr is equal to $\frac{1000}{3600} = \frac{5}{18}$ meter/sec or m/s

So, to convert a value in Km/hr to m/s, we need to multiply it with 5/18 See the example given below:

60 km/hr = $60 \times \left(\frac{5}{18}\right)$ = 16.7 m/s

Formula to convert m/s into Km/hr:
• 1 meter is equal to 1/1000 km
• 1 sec is equal to 1/3600 hours
• 1 m/s is equal to So, to covert a value in m/s to Km/hr, we will multiply it with 18/5. See the example given below:

20 m/s = $20 \times \left(\frac{18}{5}\right)$ = 72 km/hr

Points about moving trains:
1. The distance travelled by a train to cross a pole/post/stationary lamp or person is equal to the length of the train.
2. The distance travelled by train when it crosses a platform/bridge is equal to the sum of the length of the train and length of the platform.
3. When two trains are travelling in opposite directions at speeds V_1 m/s and V_2 m/s then their relative speed is the sum of their individual speeds (V_1+V_2) m/s.
4. Two trains are travelling in the same direction at V_1 m/s and V_2 m/s where $V_1 > V_2$ then their relative speed will be equal to the difference between their individual speeds (V_1-V_2) m/s.
5. When two trains of length X meters and Y meters are moving in opposite direction at V_1 m/s and V_2 m/s then the time taken by the trains to cross each other is:
$$\frac{X+Y}{V1+V2}$$
6. When two trains of length X meters and Y meters are moving in same direction at V_1 and V_2 where $V_1 > V_2$ then the time taken by the faster train to cross the slower train:
$$\frac{X+Y}{V1-V2}$$

7. When two trains X and Y start moving towards each other at the same time from points A and B and after crossing each other the train X reaches point B in a seconds and train Y reaches points A in b seconds, then Train X speed: Train Y speed:
$b^{(1/2)}$: $a^{(1/2)}$