Concept Questions with Answers

8.01
W01D3

Concept Q.: Acceleration

The graph shows the velocity as a function of time for two trains A and B running on parallel tracks. For times greater than $t = 0$, which of the following is true:

1. At time $t_2$, both trains have the same acceleration
2. Both trains have the same acceleration at some time $t_1$ before $t_2$, $0 < t_1 < t_2$.
3. Both trains have the same velocity at some time $t_1$ before $t_2$, $0 < t_1 < t_2$.

Answer: 3. The slope of the velocity vs. time curve for train A is parallel to the slope of the velocity vs. time curve for train B at some time $t_1 < t_2$. Therefore the accelerations for train A and B are equal at that instant.