# Freely falling bodies from different heights

**( Second one is dropped when the first on crosses it )**

## Questions

1. When dropped from different heights, do both the bodies reach the ground with same velocities?
2. Is the $TOD$ of A equal to the $TOD$ of B?
3. What is the velocity of A at the instant when B begins to fall down?
4. For a fixed height of A, how does the final velocity of B change when its height is increased?
5. For a fixed height of A, how does the final relative velocity of A w.r.t. B change when height of B is increased?
6. For what difference of heights will the final velocity of A be double that of B?
7. For what difference of heights will the $TOD$ of A be double that of B?
8. Plot a graph of $\Delta t$ i.e. ( $TOD_A - TOD_B$ ) as a function of ( $H_A - H_B$ ).
9. Does $\Delta t$, mentioned above, depend only of $\Delta H$ i.e. ( $H_A - H_B$ ) or does it depend of the value of $H_A$?

**Note :**

Questions given above may be visualized and answered using the simulations. Obtaining a mathematical solution is to be always treated as the final answer because such a mathematical solution implies that one is able to understand and apply the concept.

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