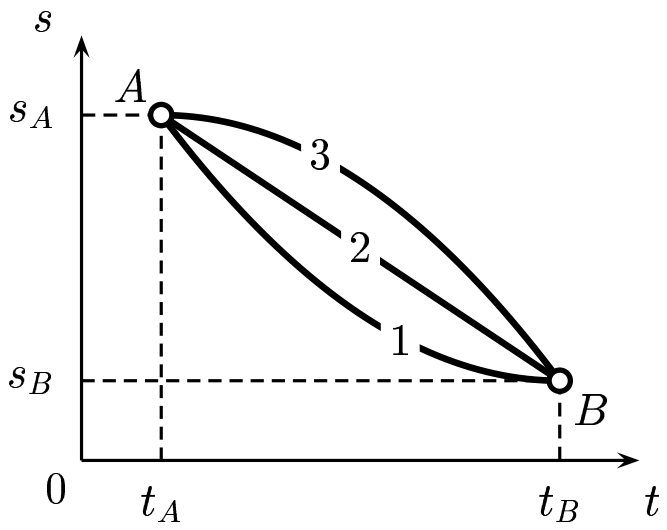
Consider three position curves between time points A and B.



$$\overline{v} = \frac{v_A + v_B}{2},$$
when a is constant.

Choose the correct relationship among quantities $\overline{v}_1, \overline{v}_2,$ and $\overline{v}_3$.

A) $\overline{v}_1 < \overline{v}_2 < \overline{v}_3$
B) $\overline{v}_1 = \overline{v}_2 = \overline{v}_3$
C) $\overline{v}_1 > \overline{v}_2 > \overline{v}_3$

The average velocity of an object is defined as follows

$$\overline{v} = \frac{\text{displacement}}{\text{time}} = \frac{s_B - s_A}{t_B - t_A}.$$

All three curves have exactly the same change in position $\Delta s = s_B - s_A$ in exactly the same time interval $\Delta t = t_B - t_A$. Hence all three average velocities are equal

$$\overline{v}_1 = \overline{v}_2 = \overline{v}_3.$$

Answer **B**.

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