

Answer on Question #47540, Physics, Mechanics, Kinematics, Dynamics

Question. Two ants race across a table 72 cm long.
One travels at 4.23 cm/s and the other at 3.99999 cm/s.
When the first one crosses the finish line, how far behind is the second one?
Answer in units of cm

Solution. Suppose that both of ants start from one point and across the table 72 cm long by straight line. The one ant who travels faster (velocity 4.23 cm/s) crosses the finish line earlier than other. To find the time when the first one crosses the finish line we divide the whole distance by velocity of the faster ant:

$$72 \text{ cm} / 4.23 \text{ cm/s} = 17,0212766 \text{ s}$$

Then we find the distance at which the second ant is at this time:

$$17,0212766 \text{ s} * 3.99999 \text{ cm/s} = 68,08494 \text{ cm}$$

And the distance between two ants is:

$$72 \text{ cm} - 68,08494 \text{ cm} = 3,915064 \text{ cm}$$

Answer. 3,915064 cm.

When the first one crosses the finish line, the second one is 3,915064 cm far behind.