

Velocity Homework 3

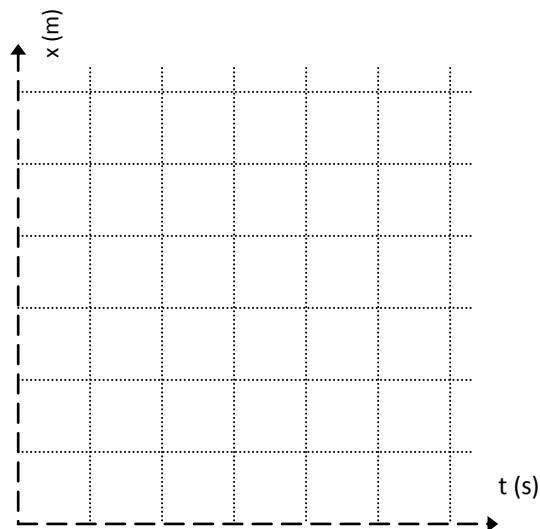
Name: _____

$$\text{Average velocity} = \frac{\text{Total displacement}}{\text{Total time}}$$

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$

1. A roller skater skating down a marked sidewalk was observed to be at the following positions at the times listed below.

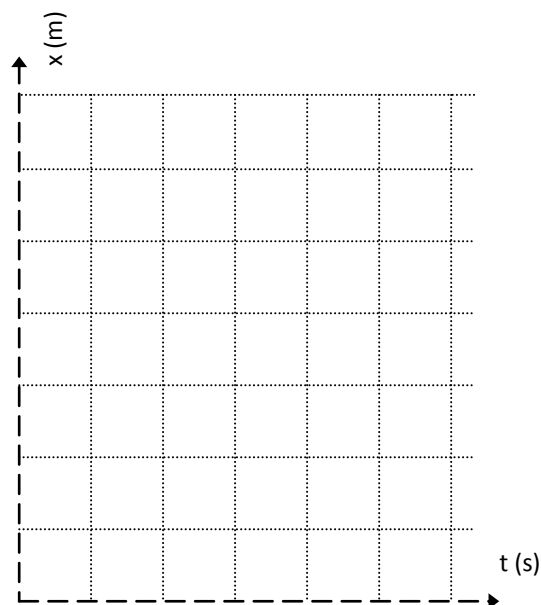
t (s)	x (m)
0.0	10.0
1.0	12.0
2.0	14.0
5.0	20.0
8.0	26.0
10.0	30.0



- Plot a position vs. time graph for the skater
- Write a mathematical equation to describe the graph above.
- How far from the origin (starting line) was she at $t = 6$ s? How do you know?
- Was her speed constant over the entire interval? How do you know?
- What was her total displacement? Show your work.

2. In a second trial the following data were obtained:

t (s)	x (m)
0.0	4.0
1.0	10.0
2.0	16.0
5.0	22.0
8.0	28.0
10.0	32.0

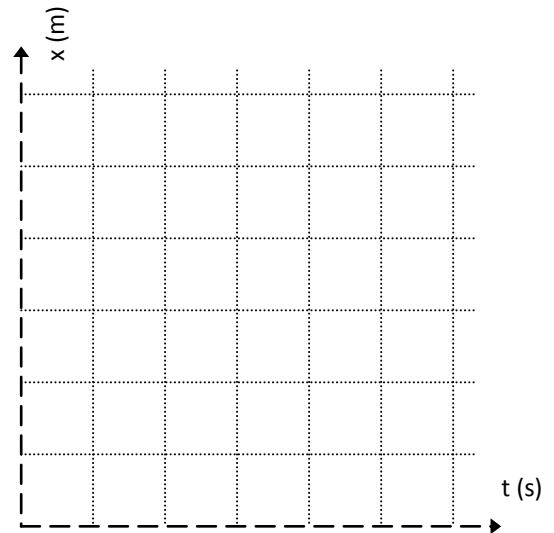


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- Plot the position vs. time graph for the skater.
- Was her speed constant? How do you know?
- How far from the (starting line) is she at $t = 6$ s? How do you know?
- What was her total displacement? Show your work.
- What was her total distance traveled? Show your work.
- What was her **average velocity**? What was her **average speed**? Show your work.

3. Our skater was now observed in a third trial and the following data were obtained:

t (s)	x (m)
0.0	0.0
2.0	6.0
4.0	12.0
6.0	12.0
8.0	8.0
10.0	4.0
12.0	0.0



- Plot the position vs. time graph for the skater.
- What happened in the interval from $t = 0$ s to $t = 4$ s? How do you know?
- What do you think happened in the time interval: $t = 4$ s to $t = 6$ s? How do you know?
- What do you think is happening in the time interval: $t = 6$ s to $t = 12$ s? How do you know?
- What was her total displacement? What was her total distance traveled? Show your work.
- What was her **average velocity**? What was her **average speed**? Show your work.