# Distance and Displacement

Name:_____ Period:_____ Date:_____

1) Describe the difference between distance and displacement.

2) Give me one example when a person's distance and displacement would be the same:
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3) Give me three example when a person's distance and displacement would be different:
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4) Susie walks 12 paces north and 26 paces east. What distance did Susie travel and what was her final displacement?

5) Jimmy wakes up from a nap on the couch and walks 15m to his refrigerator; he gets some leftovers goes 3 yards to the microwave and heats his dinner up. From the microwave it is a 0.016 km walk back to the couch where he eats his leftover dinner. A) What distance did Jimmy travel? B) What was Jimmy's final displacement? Why?
   A)   B)

6) A racecar driver zooms around a circular track of radius 50 m. (hint: circumference = $2\pi r$)
   a) If the driver goes around the track 4 times, what distance did he travel?

   b) If the driver goes around the track 5 ½ times, what was his displacement?

7) You have been told that a person has walked 500 m. What can you safely say about the person's final position relative to the starting point?

8) A student throws a rock straight upward from shoulder level (1.6 m above the ground). When the rock reaches the ground, what will its displacement be? Prove it to me with a picture.

9) Robbin, roller skating down a marked sidewalk was observed to be at the following positions at the times listed below.
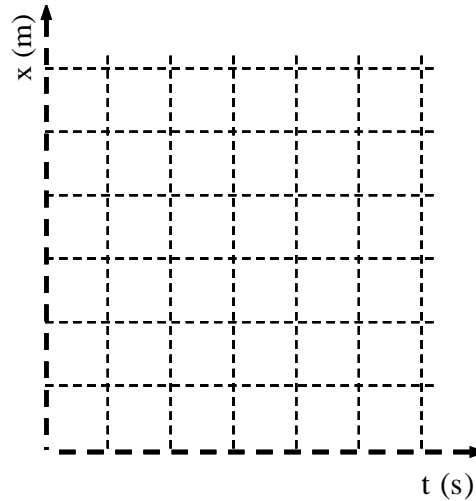
t (s)	x (m)
0.0	10.0
1.0	12.0
2.0	14.0
5.0	20.0
8.0	26.0
10.0	30.0

x (m)

t (s)
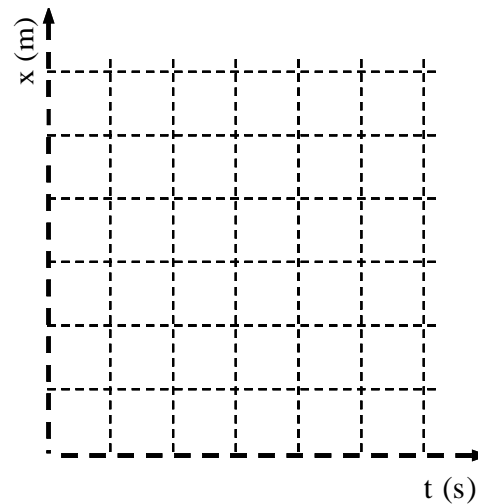
a. Plot a position vs. time graph for the skater.

b. How far from the zero position was Robbin at t = 6s? How do you know?

c. Write a mathematical expression to describe the line in (a).

d. Was his speed constant over the entire interval? How do you know?

10) In a second trial, the timer started her watch a bit late. The following data were recorded.

t (s)	x (m)
0.0	4.0
2.0	10.0
4.0	16.0
6.0	22.0
8.0	28.0
10.0	34.0

x (m)

t (s)

a. Plot a position vs. time graph for the skater.

b. How far from the zero position was Robbin at t = 5s? How do you know?

c. Was her speed constant over the entire interval? How do you know?

d. In the first trial the skater was further along at t = 2s than in the second trial. Does this mean he was skating faster? Explain how you know.