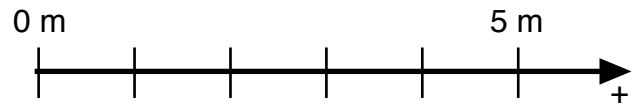
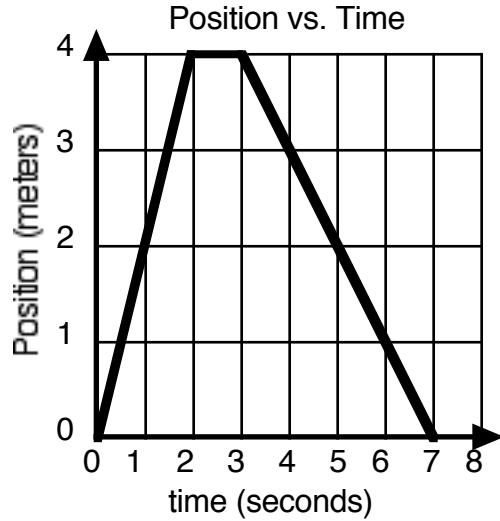


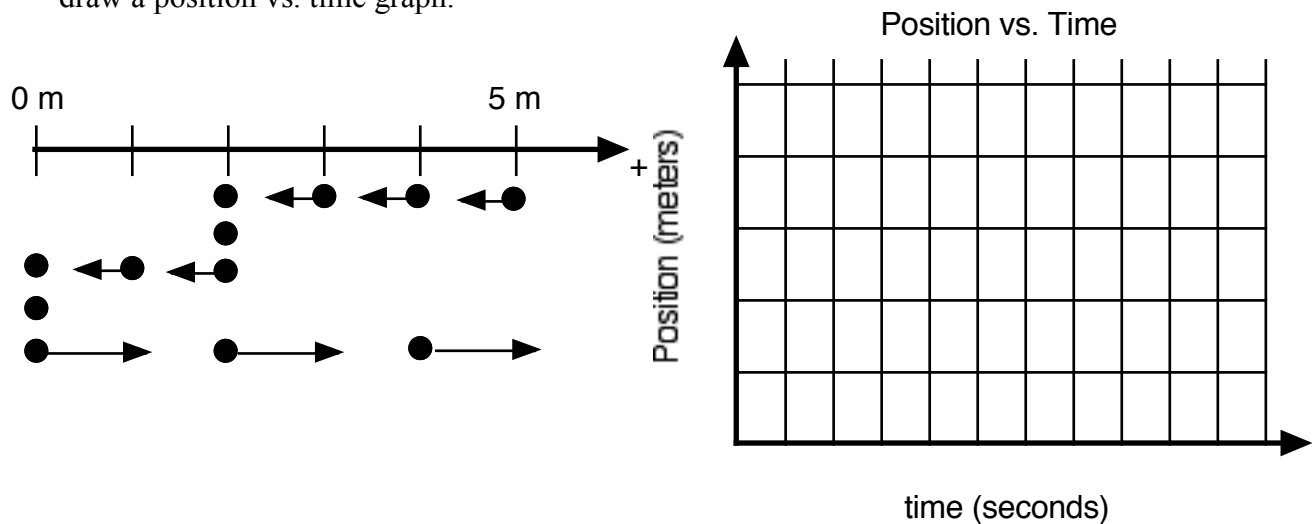
Constant Velocity Particle Model Worksheet 1: Motion Maps and Position vs. Time Graphs

1. Given the following position vs. time graph, draw a motion map with one dot for each second.



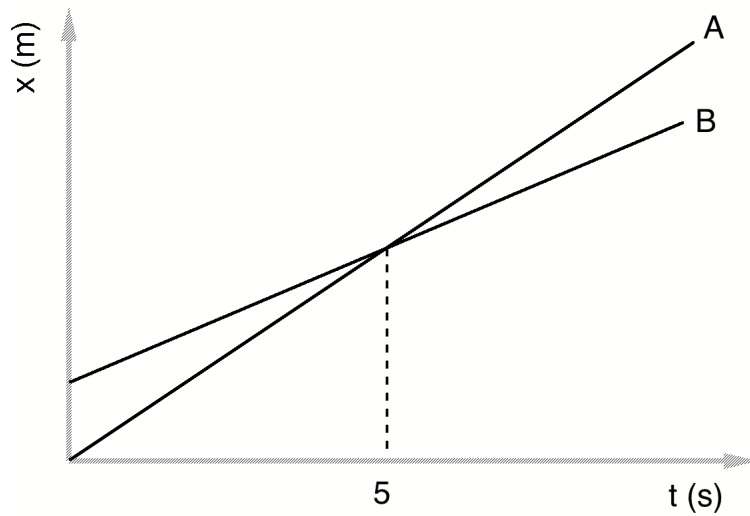
Describe the motion of the object in words:

2. Given the following motion map, where positions have been recorded with one dot each second, draw a position vs. time graph.



Describe the motion of the object in words:

3. Consider the position vs. time graph below for cyclists A and B.



a. Do the cyclists start at the same point? How do you know? If not, which is ahead?

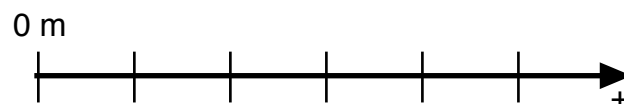
b. At $t = 7$ s, which cyclist is ahead? How do you know?

c. Which cyclist is traveling faster at 3 s? How do you know?

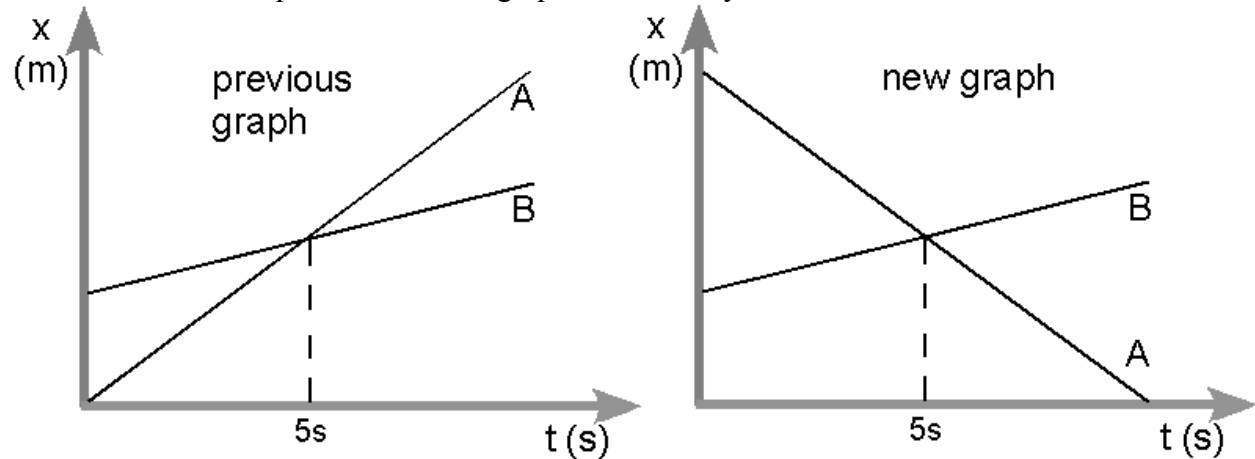
d. Are their velocities equal at any time? How do you know?

e. What is happening at the intersection of lines A and B?

f. Draw a motion map for cyclists A and B.



4. Consider the new position vs. time graph below for cyclists A and B.



a. How does the motion of the cyclist A in this graph compare to that of A in question 3?

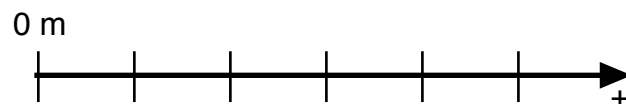
b. How does the motion of cyclist B in this graph compare to that of B in question 3?

c. Which cyclist has the greater speed? How do you know?

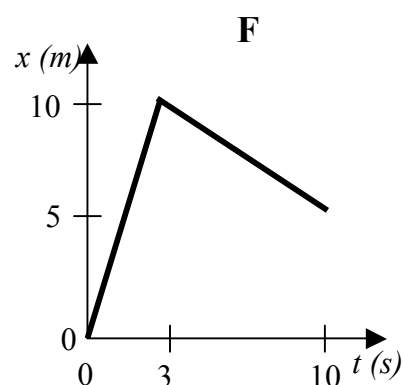
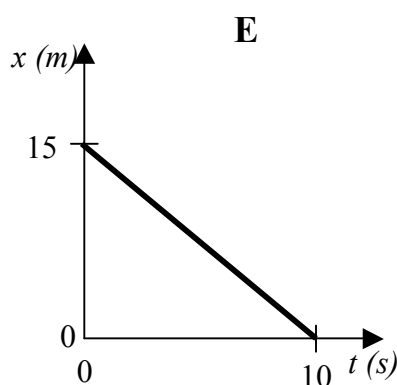
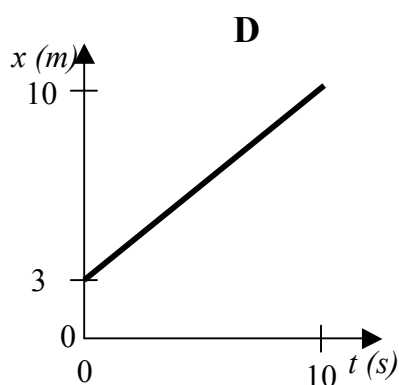
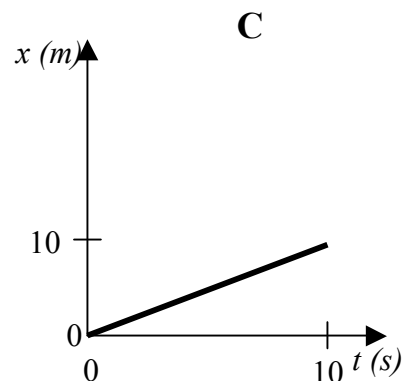
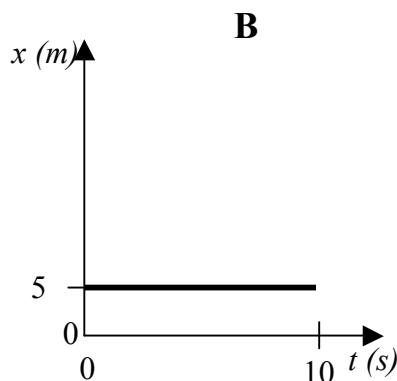
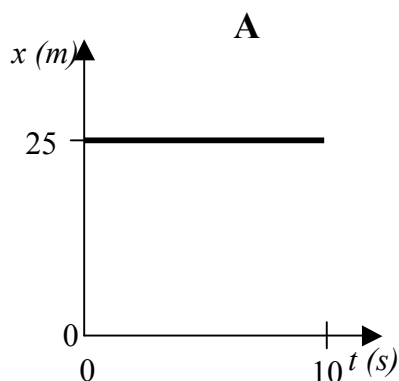
d. Describe what is happening at the intersection of lines A and B.

e. Which cyclist has traveled further during the first 5 seconds? How do you know?

f. Draw a motion map for cyclists A and B.



5. To rank the following, you may need to look at the key ideas sheet for the difference between *displacement* and *odometer reading*.



a. Rank the graphs according to which show the greatest **displacement** from the beginning to the end of the motion.

Most positive \rightarrow 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ \leftarrow Most negative

Explain your reasoning for your ranking:

b. Rank the graphs according to which show the greatest **odometer reading** from the beginning to the end of the motion.

Greatest 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ Least

Explain your reasoning for your ranking: