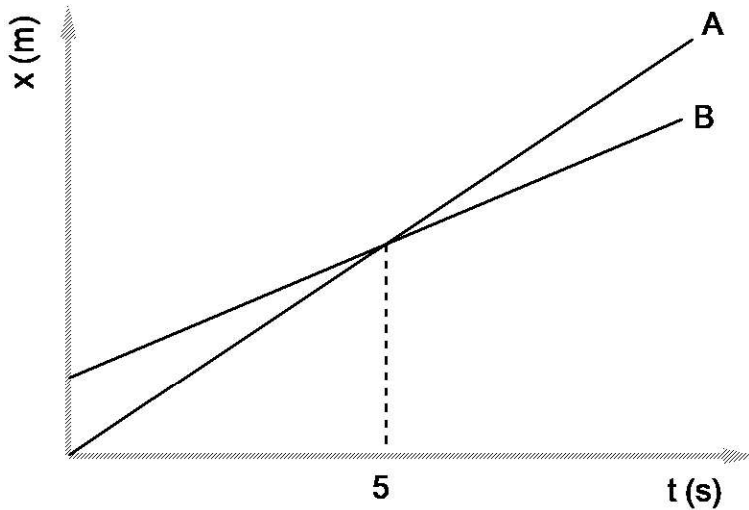


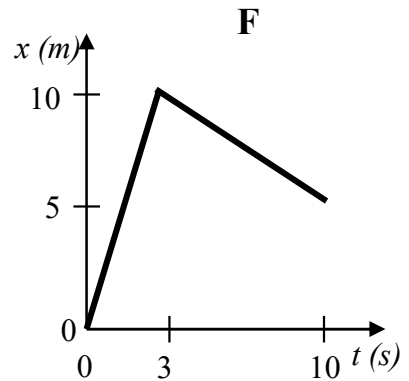
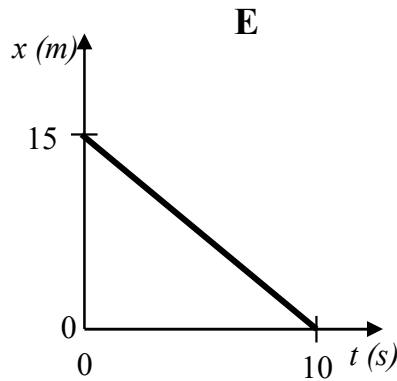
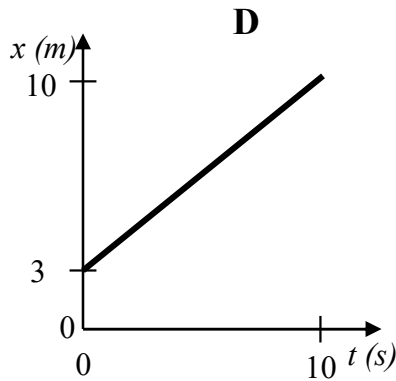
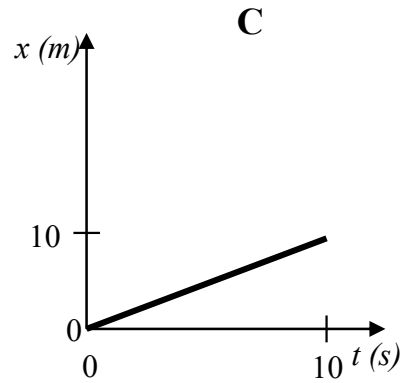
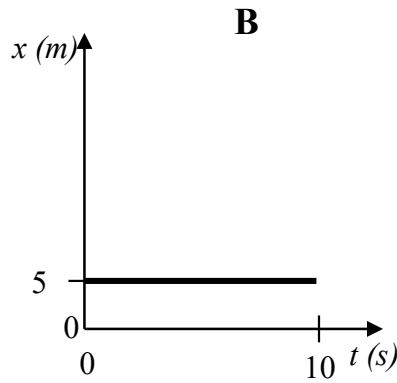
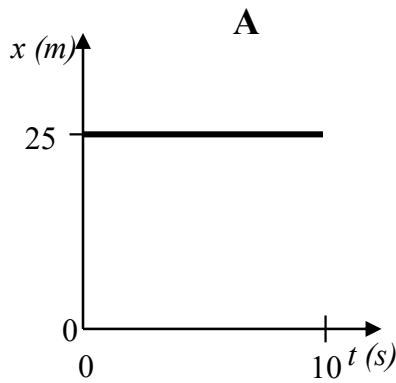
UNIT II Worksheet 1

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



- Do the cyclists start at the same point? How do you know? If not, which is ahead?
- At $t = 7$ s, which cyclist is ahead? How do you know?
- Which cyclist is travelling faster at $t = 3$ s? How do you know?
- Are their velocities equal at any time? How do you know?
- What is happening at the intersection of lines A and B?

3. 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

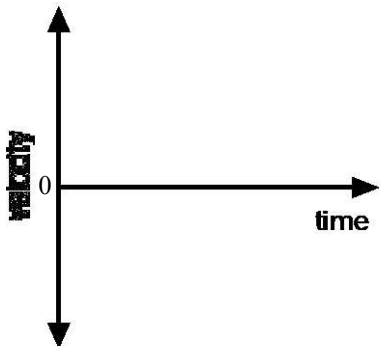
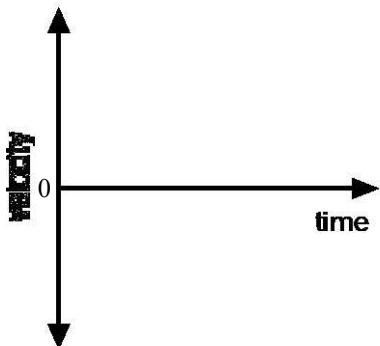
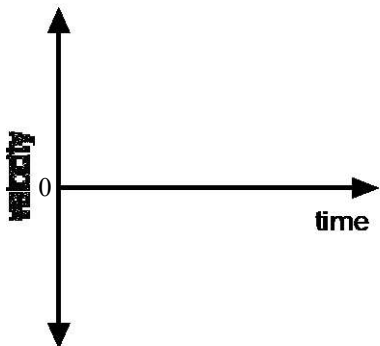
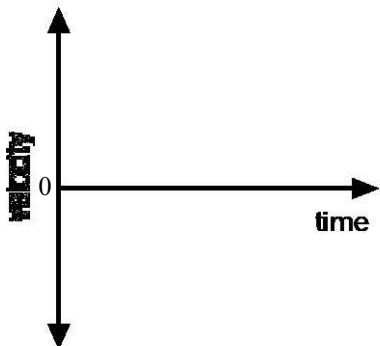
Explain your reasoning for your ranking:

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

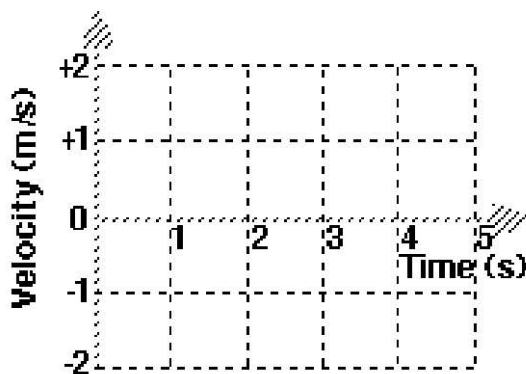
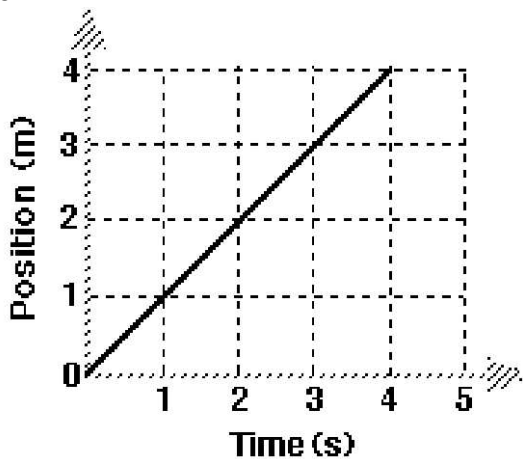
Explain your reasoning for your ranking:

Sketch velocity vs time graphs corresponding to the following descriptions of the motion of an object.

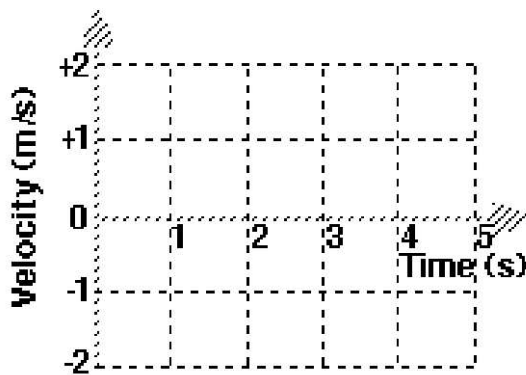
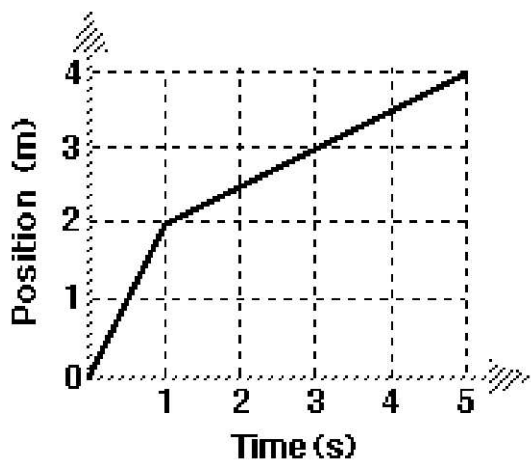
4. The object is moving in the positive direction at a constant (steady) speed.	 <p>A velocity vs time graph with 'velocity' on the vertical axis and 'time' on the horizontal axis. The origin is marked with '0'. A horizontal line is drawn in the positive velocity region, extending to the right.</p>
5. The object is standing still.	 <p>A velocity vs time graph with 'velocity' on the vertical axis and 'time' on the horizontal axis. The origin is marked with '0'. A horizontal line is drawn along the zero velocity axis, extending to the right.</p>
6. The object moves in the negative direction at a steady speed for 10s, then stands still for 10s.	 <p>A velocity vs time graph with 'velocity' on the vertical axis and 'time' on the horizontal axis. The origin is marked with '0'. A horizontal line is drawn in the negative velocity region, extending to the right. After a certain time interval, the line drops to the zero velocity axis and continues horizontally to the right.</p>
7. The object moves in the positive direction at a steady speed for 10s, reverses direction and moves back toward the negative direction at the same speed.	 <p>A velocity vs time graph with 'velocity' on the vertical axis and 'time' on the horizontal axis. The origin is marked with '0'. A horizontal line is drawn in the positive velocity region, extending to the right. After a certain time interval, the line drops to the zero velocity axis, then continues horizontally in the negative velocity region.</p>

Draw the velocity vs time graphs for an object whose motion produced the position vs time graphs shown below at left.

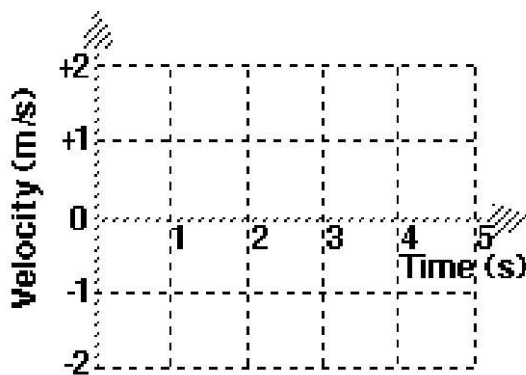
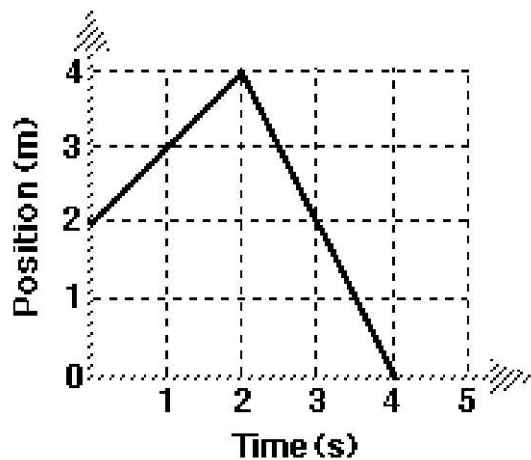
8.



9.



10.



11. For many graphs, both the **slope** of the line and the **area** between the line and the horizontal axis have physical meanings.

a. What does the slope of a position time graph tell you about the motion of an object? _____

b. What does the area under the velocity-time graph tell you about the motion of an object? _____