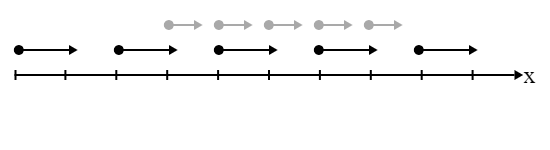
**Unit 2 – Worksheet 3**

**Multiple Objects**

Look at the motion map below which represents the positions of two runners every 2 seconds. Each tick on the axis represents 2 meters.



1. List everything you can determine about the two runners from this motion map.
2. Are the two runners ever in the same place at the same time? If so, where? How do you know?
3. Draw a state diagram showing the two runners at the 5 times shown in the motion map.
4. What code would we need to write to simulate these two runners? Write down the initial conditions and functions you think you would need to write.
5. Complete two design recipes for the functions you wrote on the previous page.
6. Open the code found here: <https://tinyurl.com/ycjc9uan>. Enter your initial parameters and functions then run the simulation. Do the runners meet at the position you expected in Question 2?

Write a motion map and identify the initial conditions for each of the situations below, then change the parameters in your simulation and run it to check your predictions.

1. Runner 1 starts and , runner 2 starts at . The two runners pass each other at .

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1. Runner 1 moves with a velocity of -5 m/s, runner 2 moves with a velocity of 4 m/s. The two runners pass each other at .

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1. Runner 1 moves with a velocity of 4 m/s, runner 2 starts at . Runner 1 passes runner 2 at .

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