Converting a *d-t* Graph to a *v-t* Graph

1. Mark each point on the *d-t* graph where the slope of the graph changes (these are actually points where the velocity of the object changes).

2. Determine the slope (velocity) of the *d-t* graph for each straight line segment.

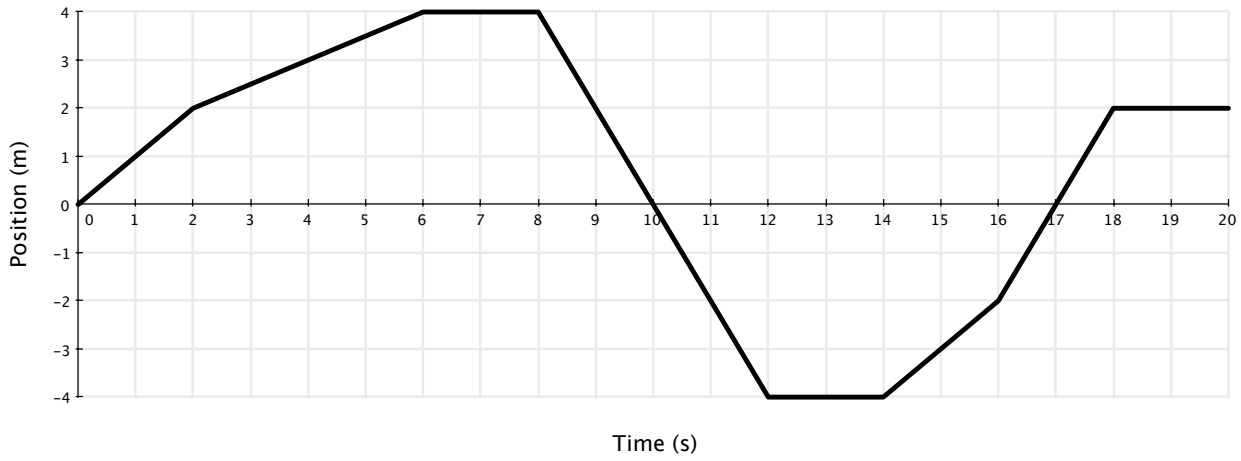
3. Draw *v-t* axes beneath the *d-t* graph and make the time axis the same as the one on the *d-t* graph.

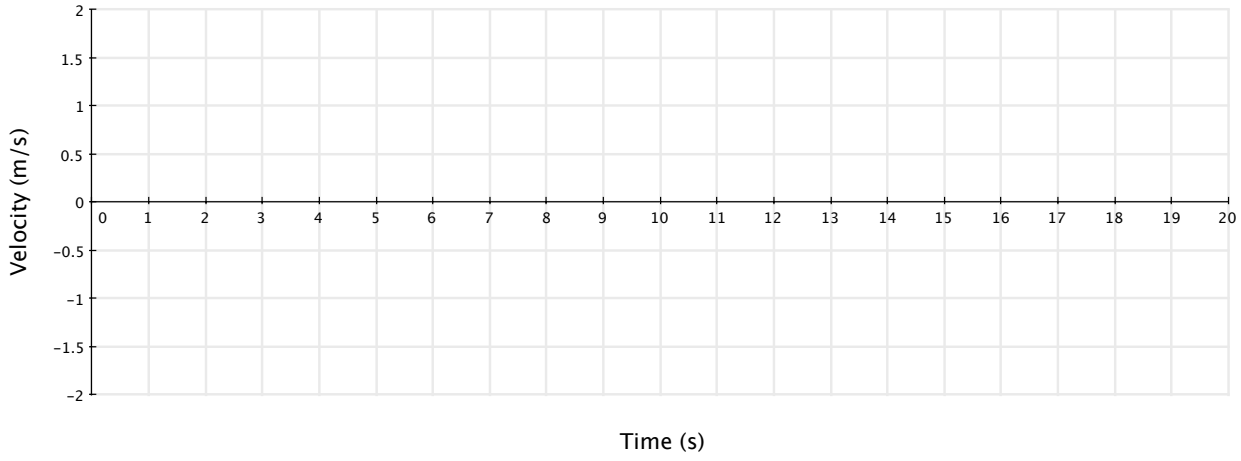
4. Draw vertical lines (lightly) from each marked point down to the *v-t* graph.

5. During each segment where the velocity is constant, draw a horizontal line in the corresponding segment on the *v-t* graph.

6. Join the line segments you have drawn by connecting their endpoints with straight lines (either vertical or sloped).

Example 1





Converting a *v-t* Graph to a *d-t* Graph

1. Divide the area under the *v-t* graph into a series of sections with defined areas (triangles and rectangles).

2. Calculate or estimate the area (displacement) of each section of the *v-t* graph, noting in particular whether it is positive or negative.

3. Draw *d-t* axes beneath the *v-t* graph and make the time axis the same as the one on the *v-t* graph.

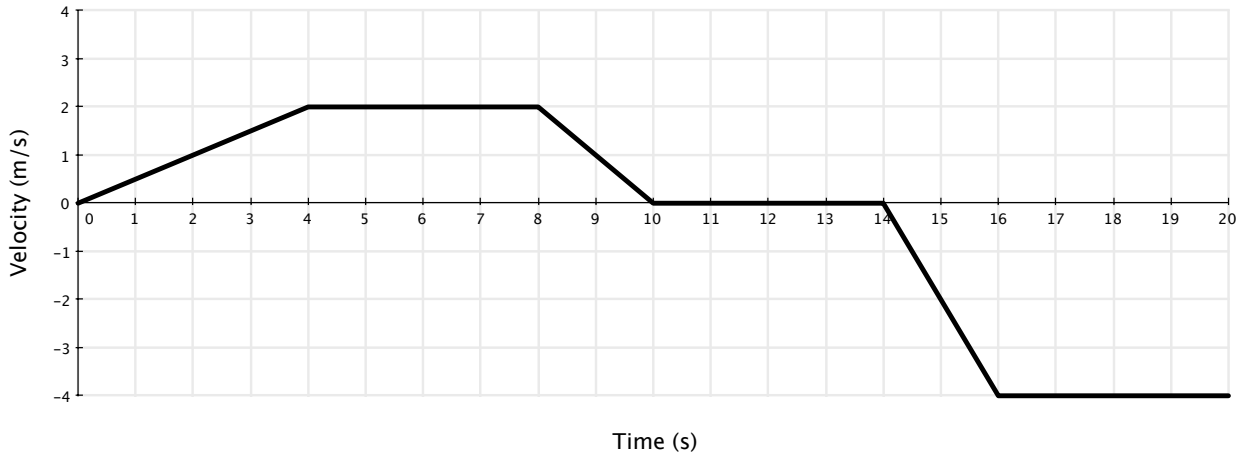
4. Mark the points on the *v-t* graph at the end of each section, indicating whether the motion is positive or negative.

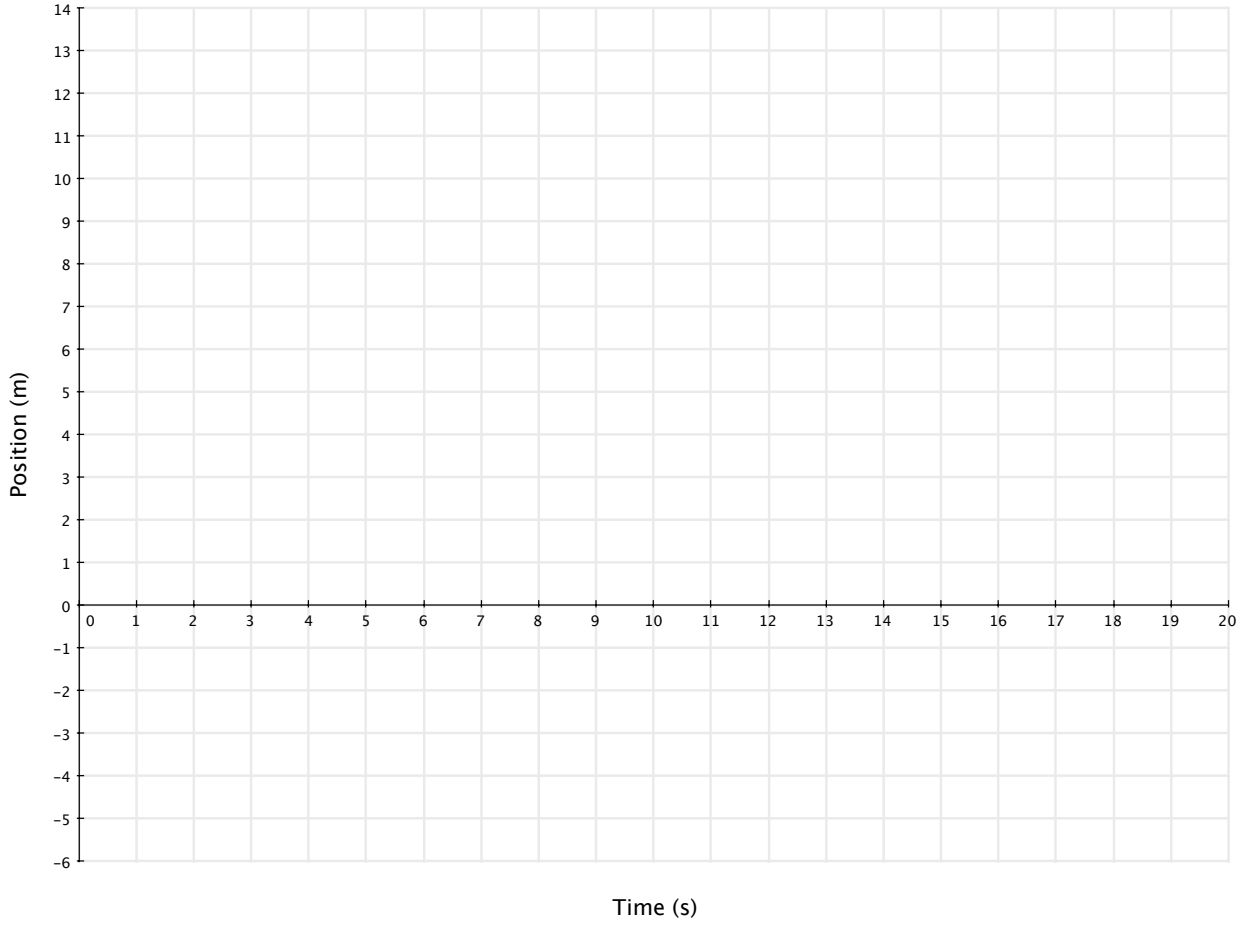
5. Draw vertical lines (lightly) from each marked point down to the *d-t* graph.

6. Mark the value of the displacement for each point at the corresponding time on the *d-t* graph.

7. Join the points, and check that the lines match the motion.

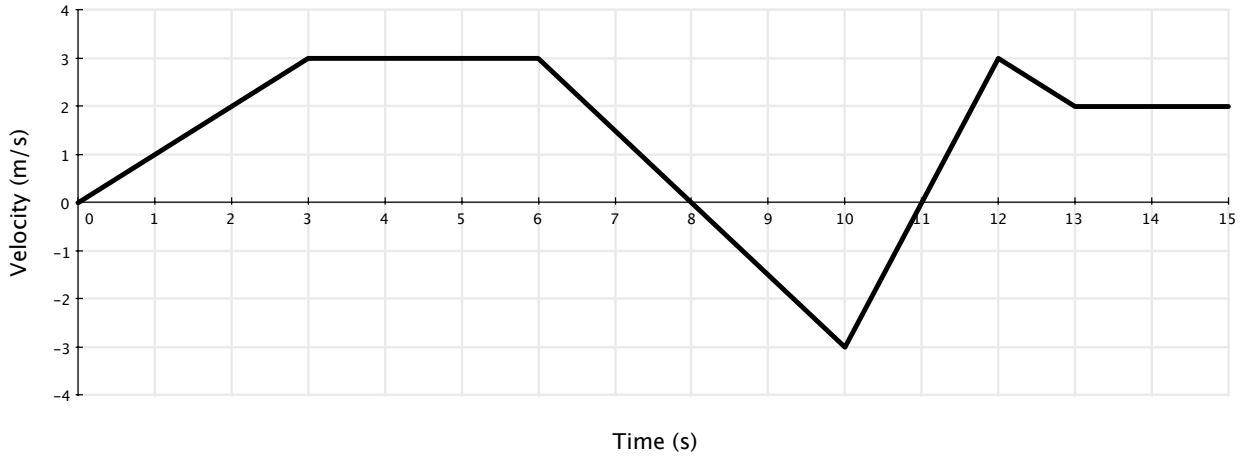
Example 2

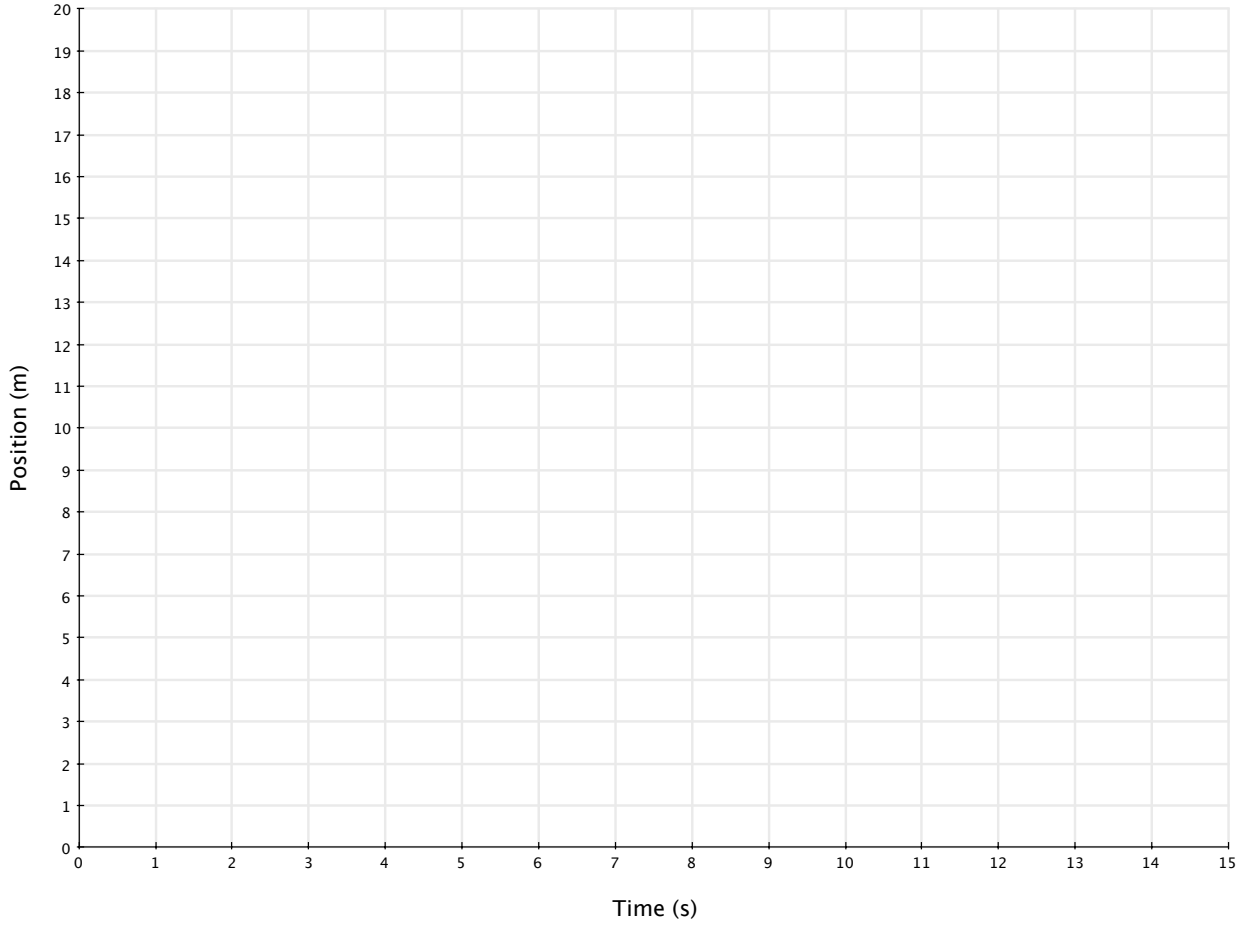




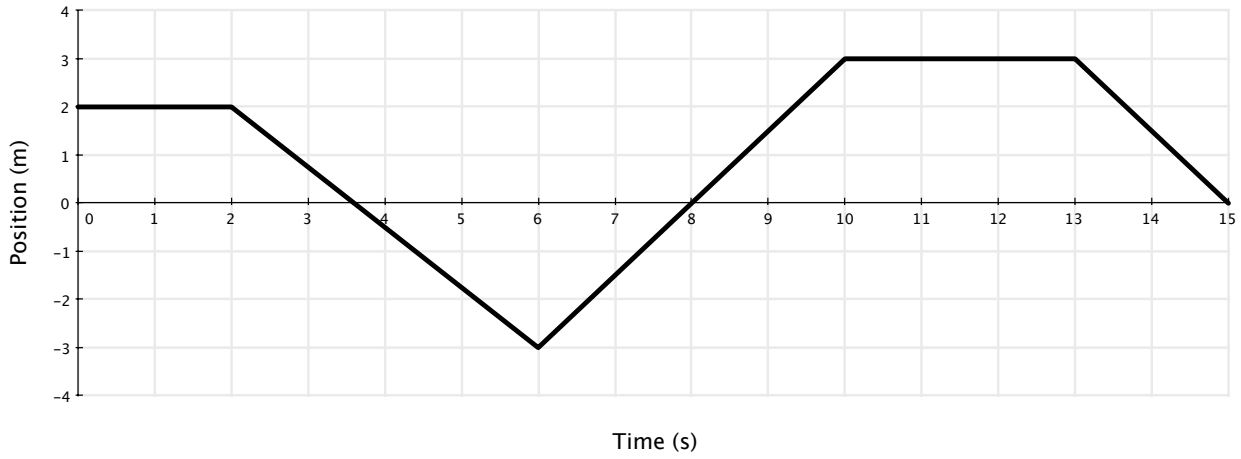
Worksheet

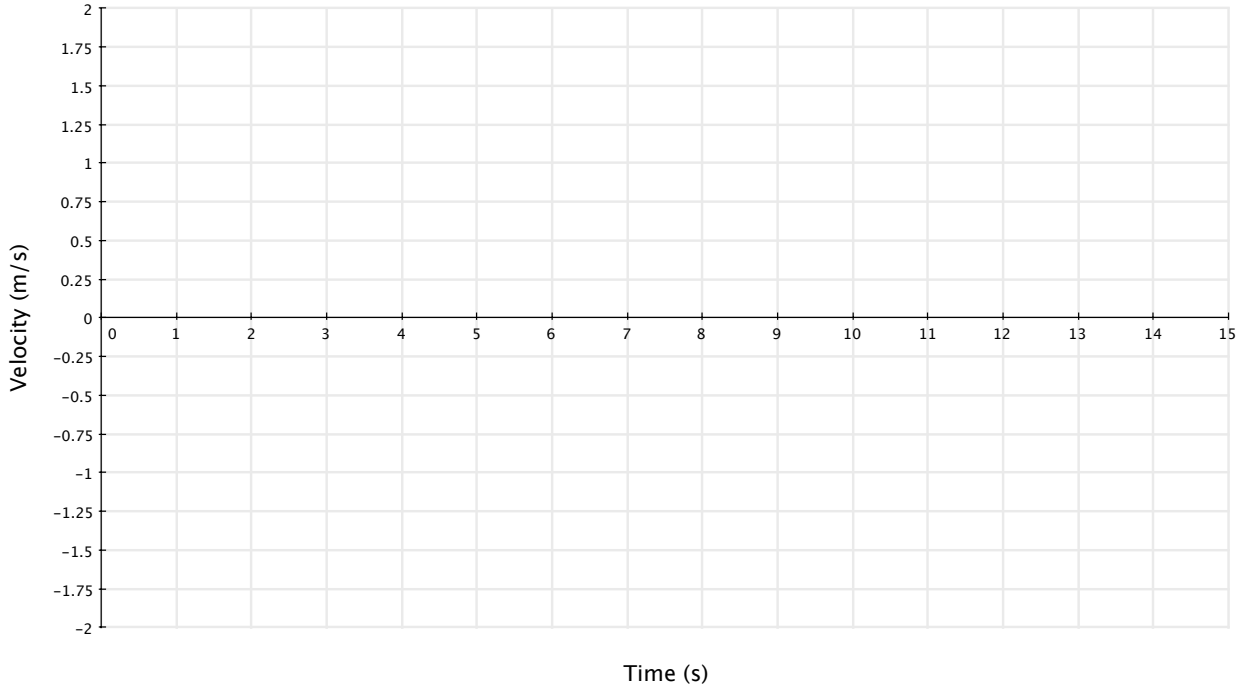
1. Convert the following velocity-time graph into the corresponding position-time graph.



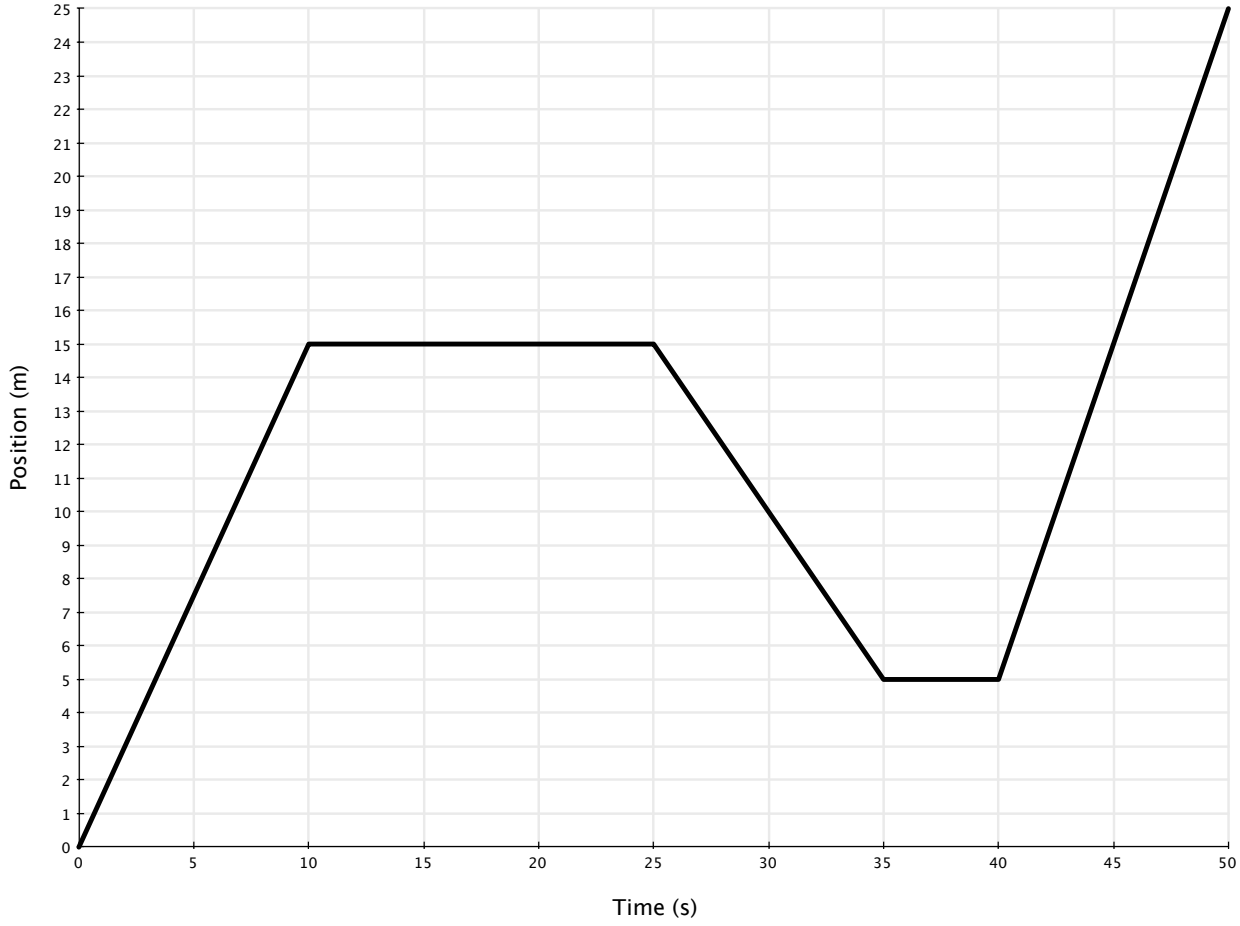


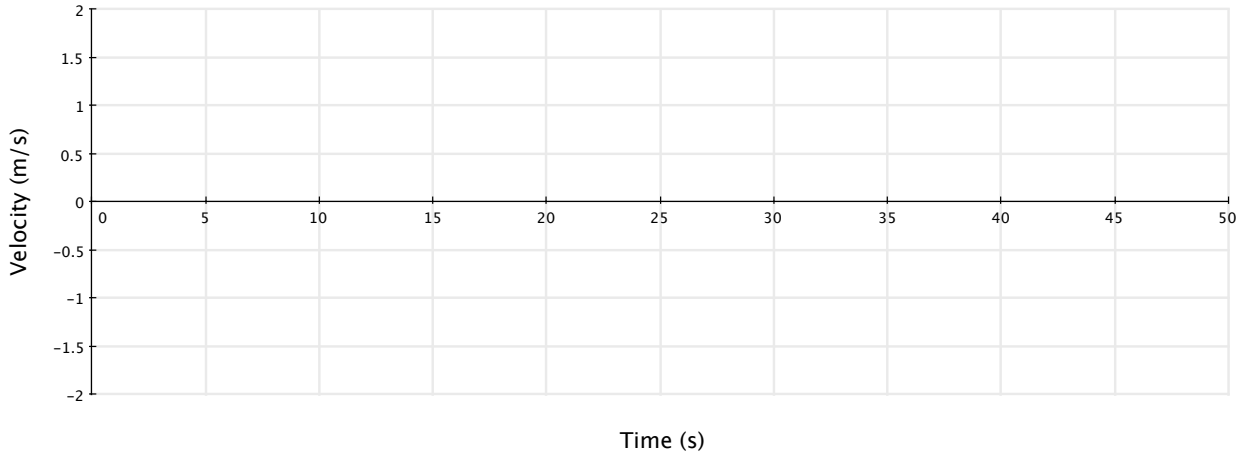
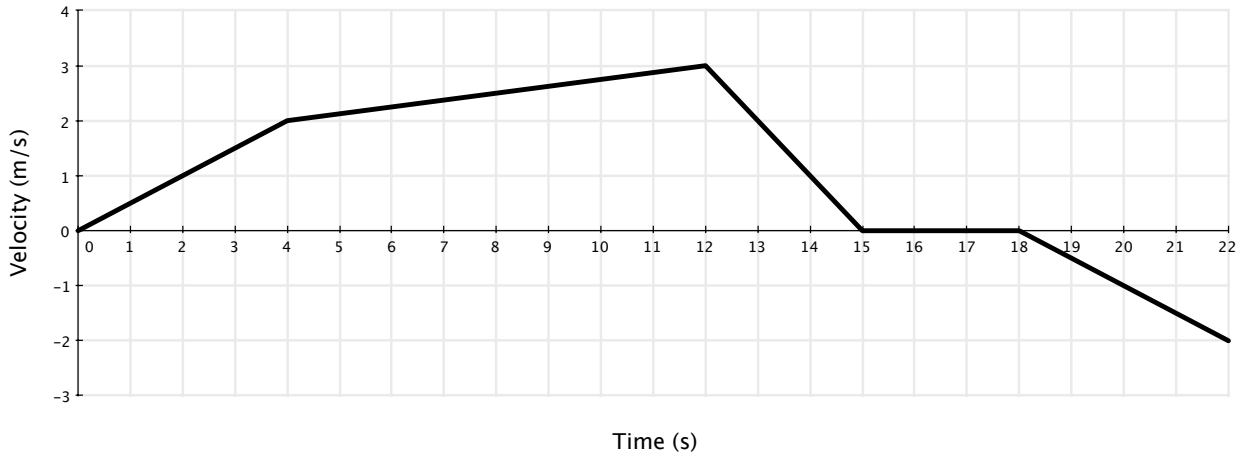
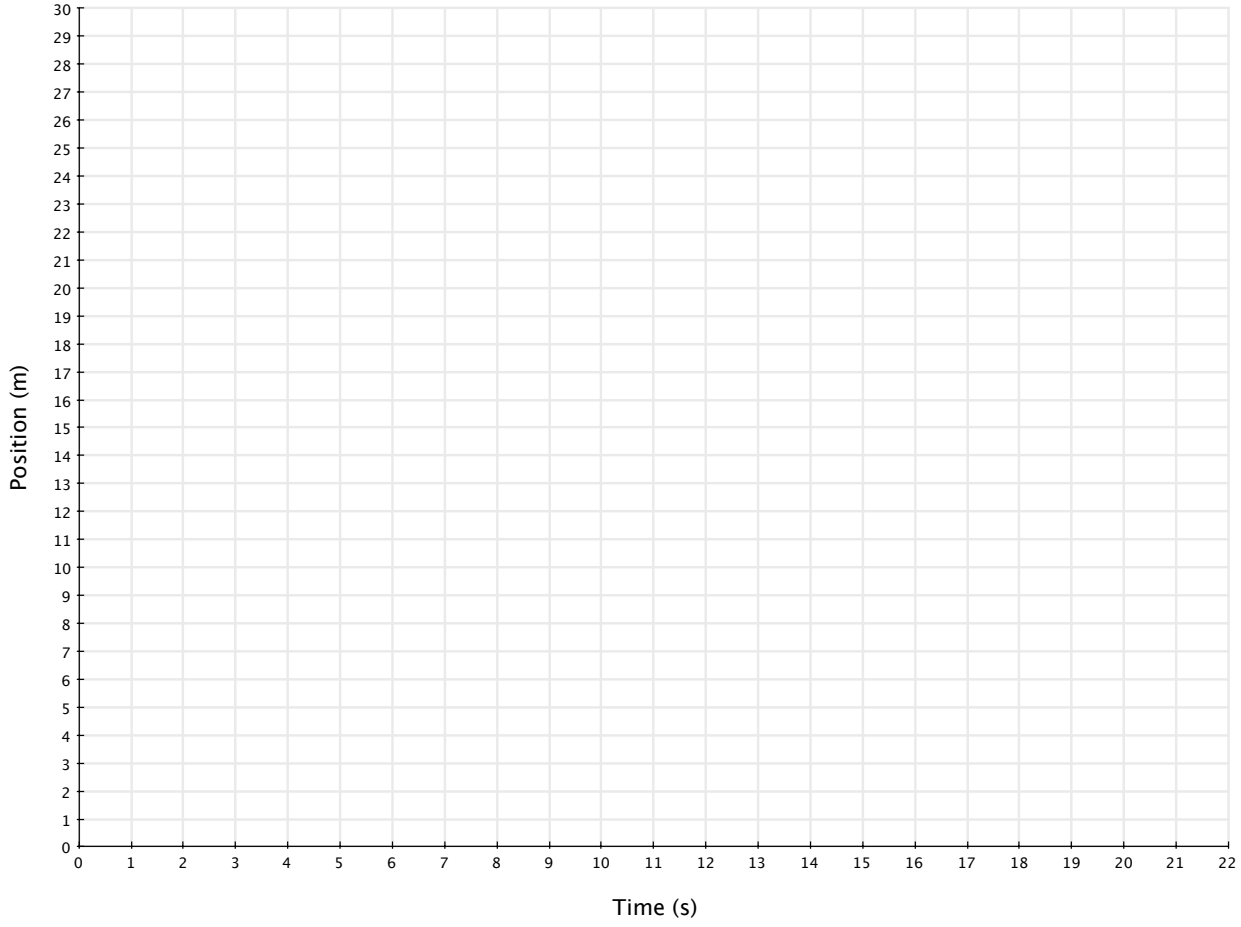
2. Convert the following position-time graph into the corresponding velocity-time graph.





3. Convert the following position-time graph into the corresponding velocity-time graph.





4. Convert the following velocity-time graph into the corresponding position-time graph.