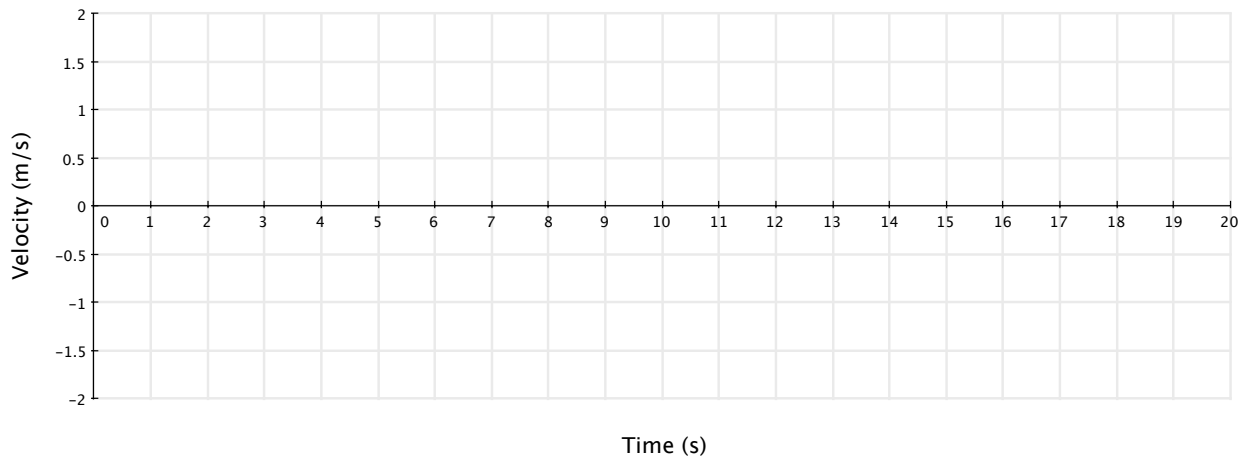
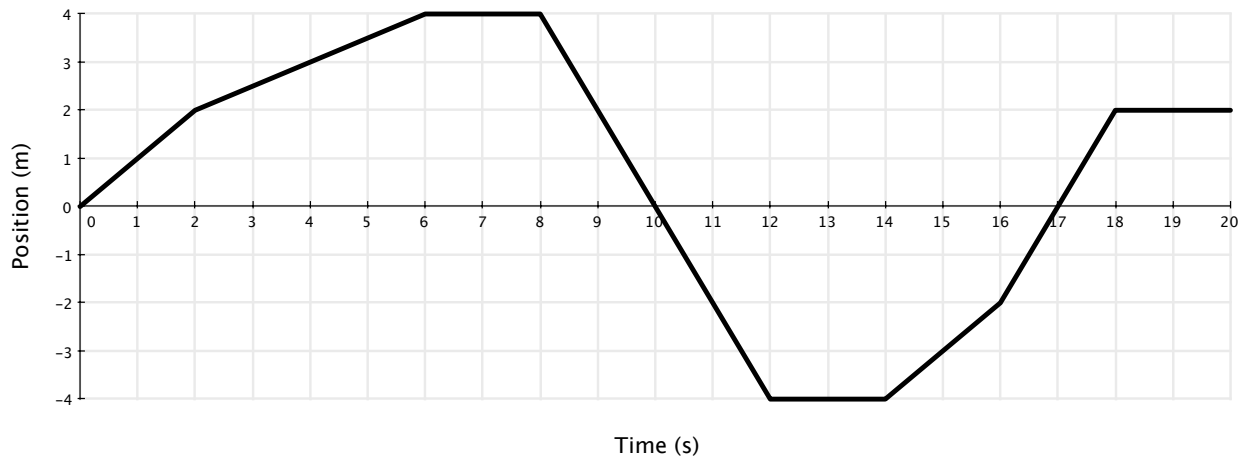


## Converting a $d-t$ Graph to a $v-t$ Graph

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).

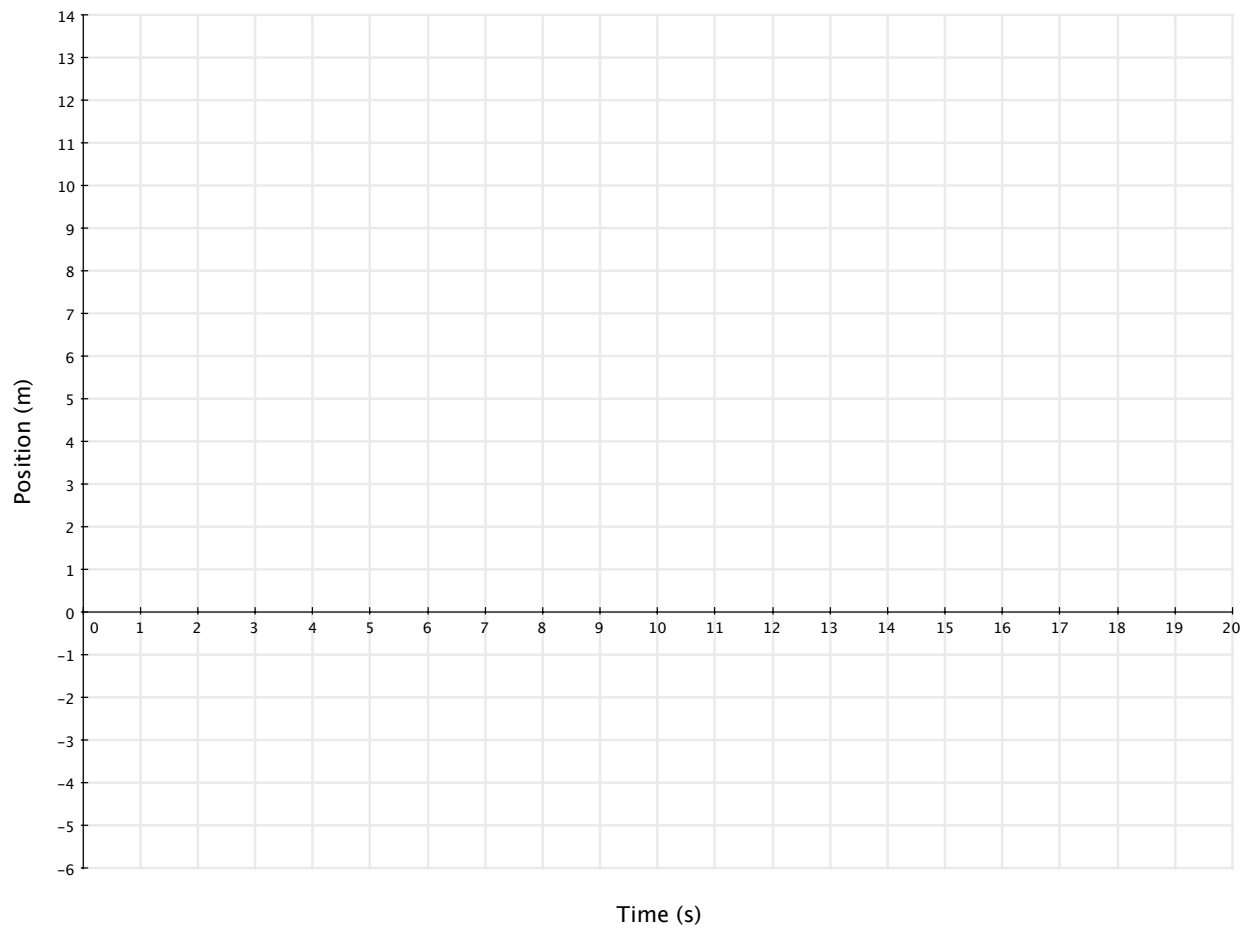
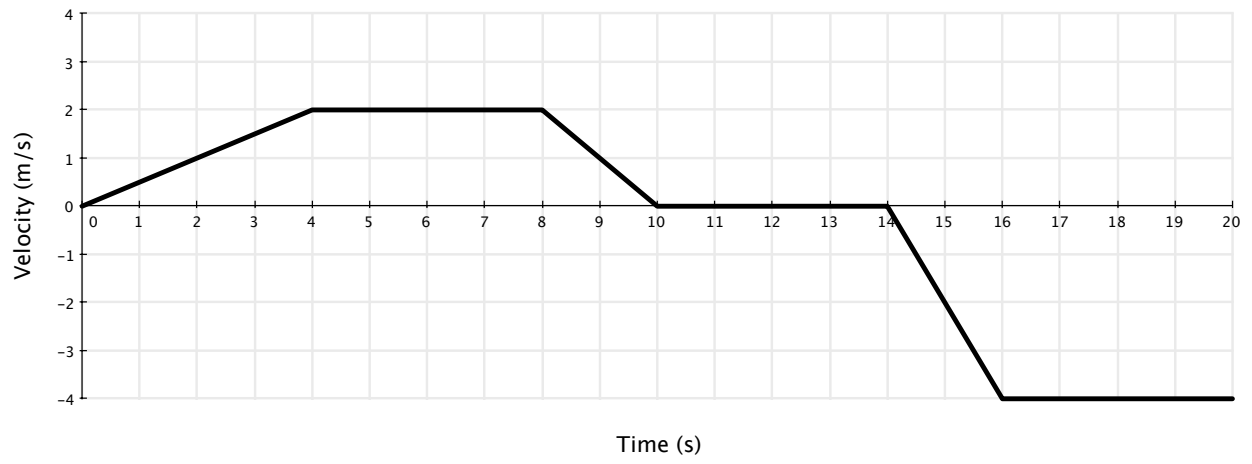
### Example 1



### Converting a $v-t$ Graph to a $d-t$ Graph

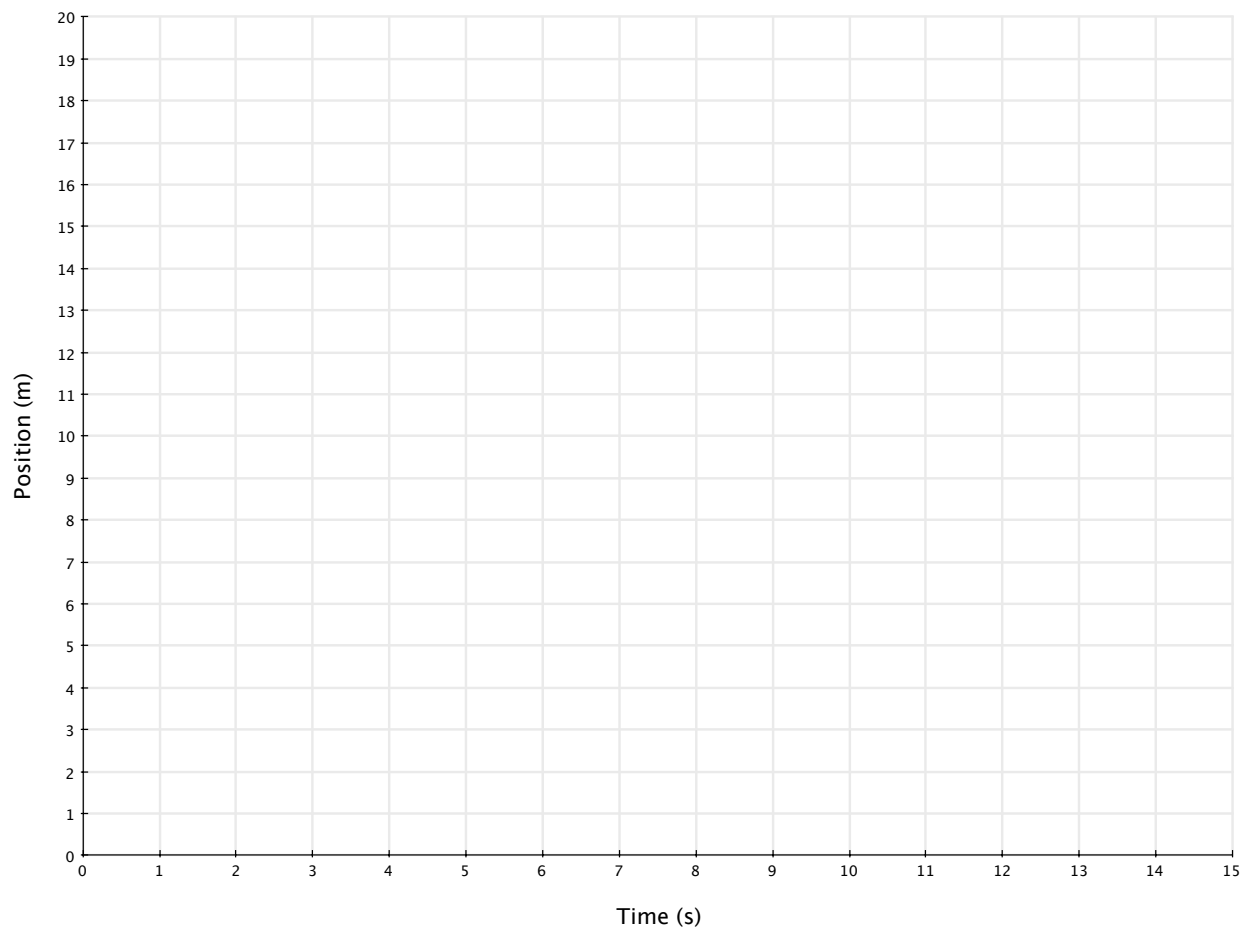
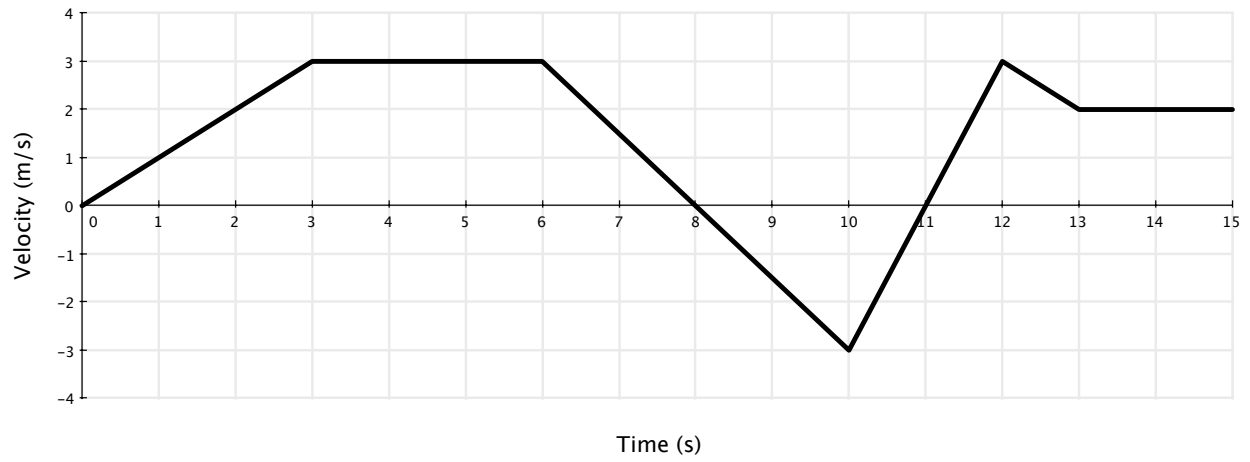
1. Divide the area under the  $v-t$  graph into a series of sections with defined areas (triangles and rectangles).
2. Calculate or estimate the area (displacement) of each section of the  $v-t$  graph, noting in particular whether it is positive or negative.
3. Draw  $d-t$  axes beneath the  $v-t$  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

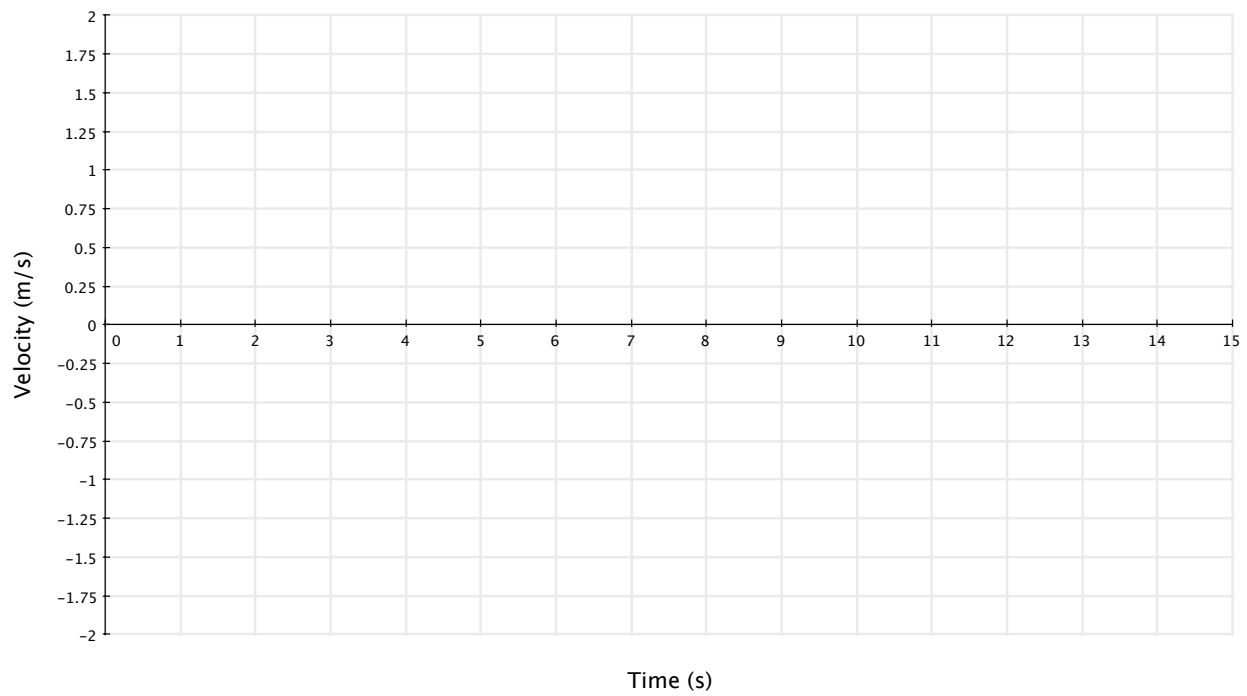
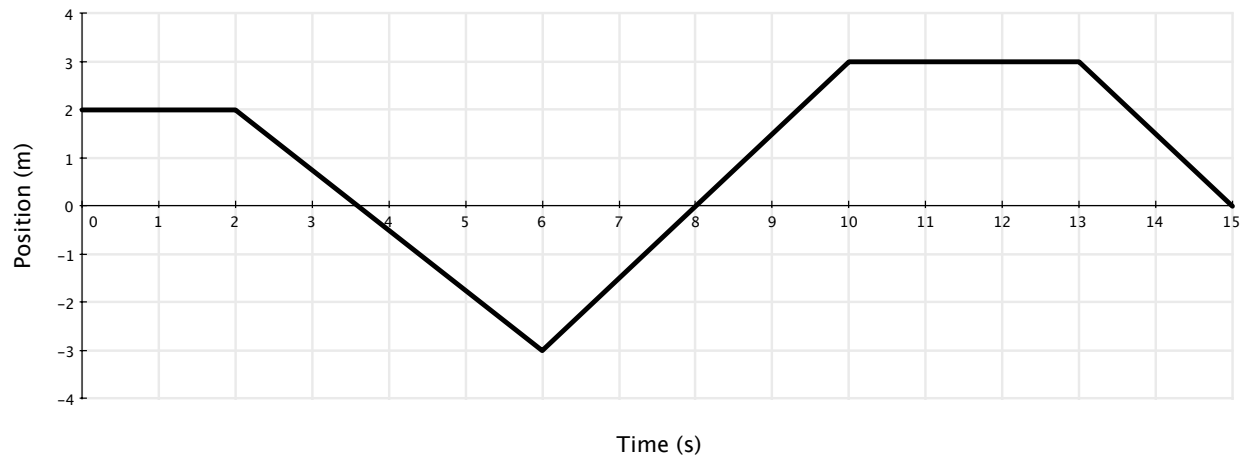


## Worksheet

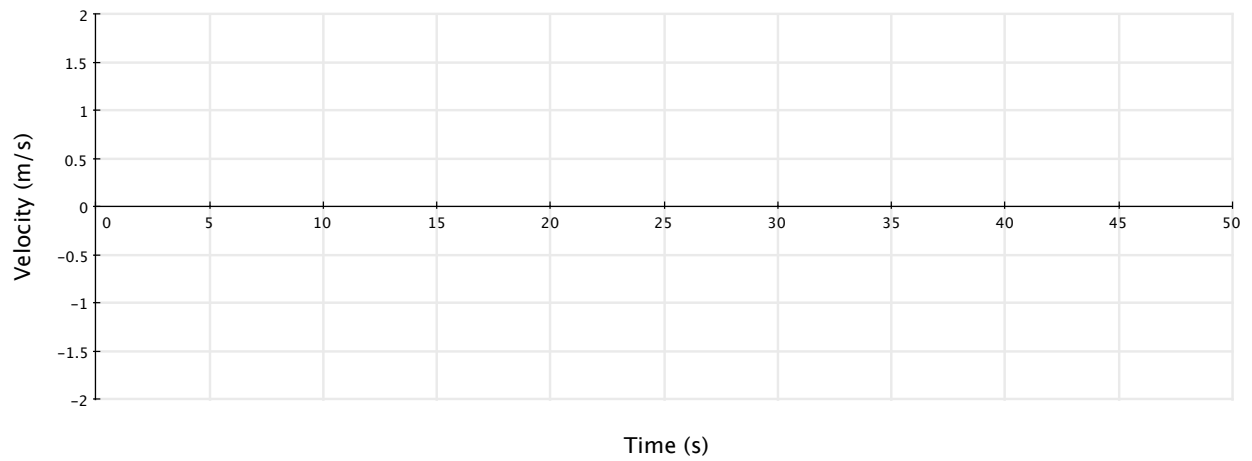
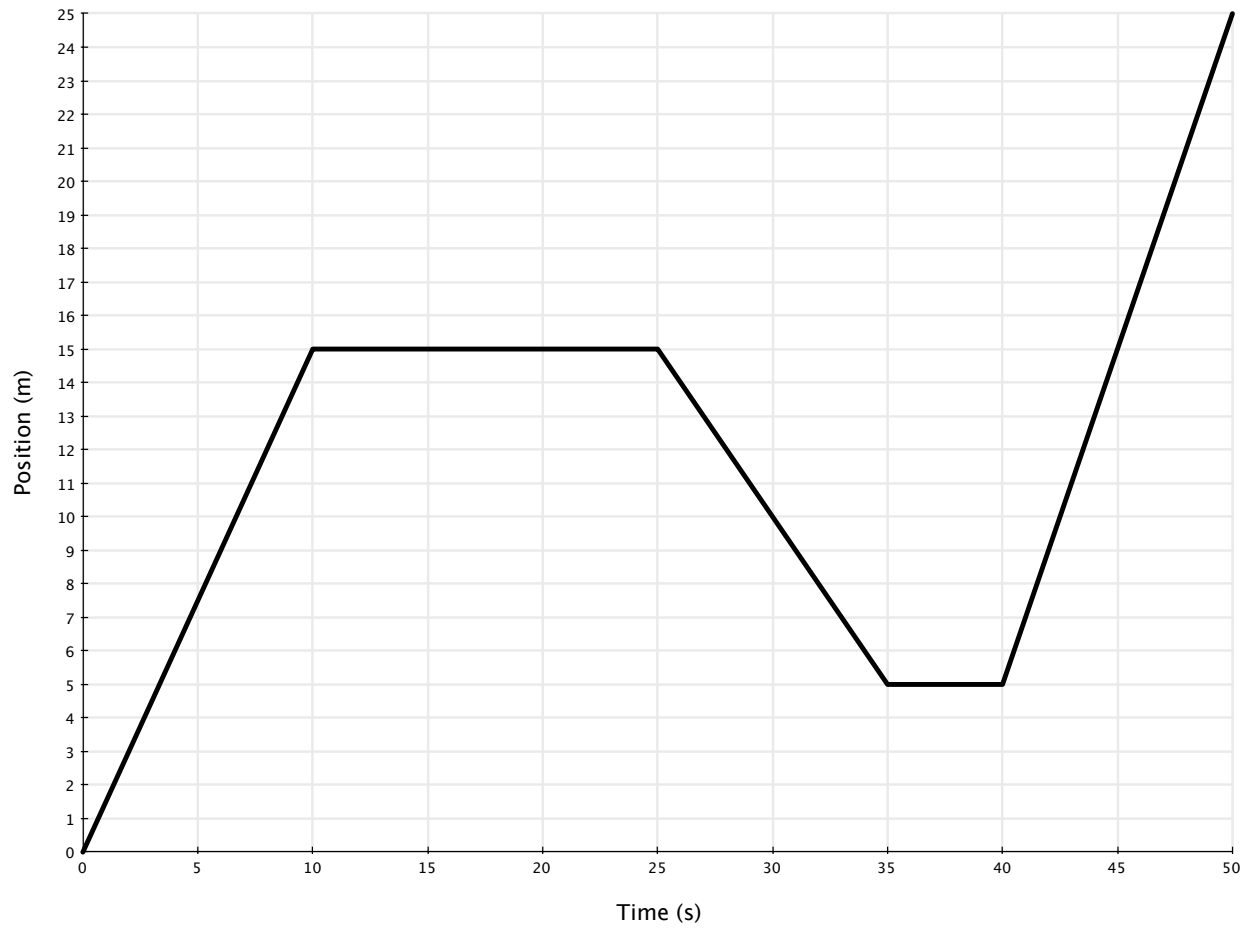
1. Convert the following velocity-time graph into the corresponding position-time graph.



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.

