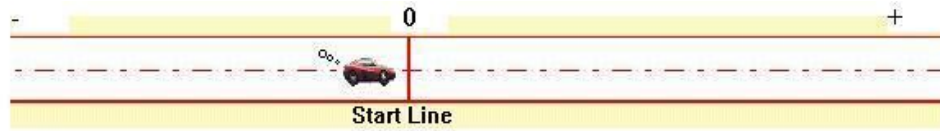
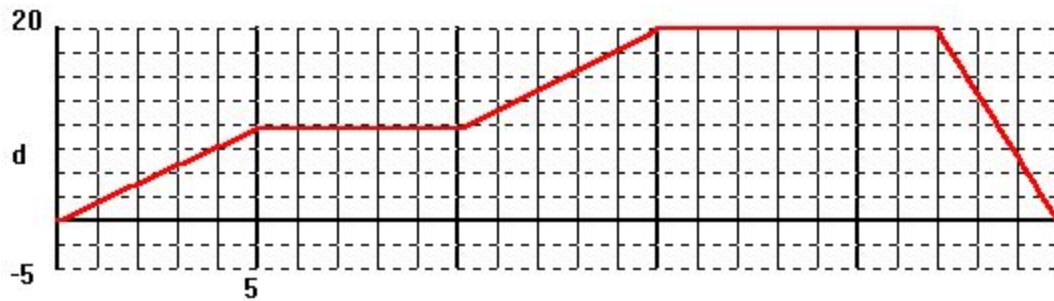


## Understanding One-Dimensional Motion

The following graphs refer to a toy car which can move to the right or left along a horizontal line. The positive direction is to the right.

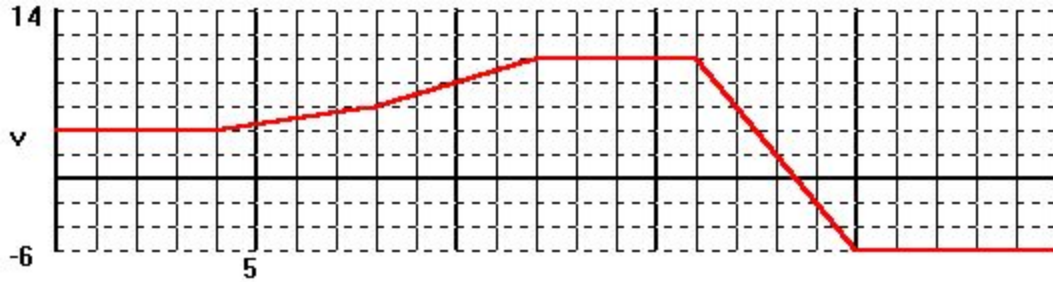


**Exercise 1:** The following graph shows the position of a toy car versus the time. Answer the following questions based on this graph. Show all calculations.



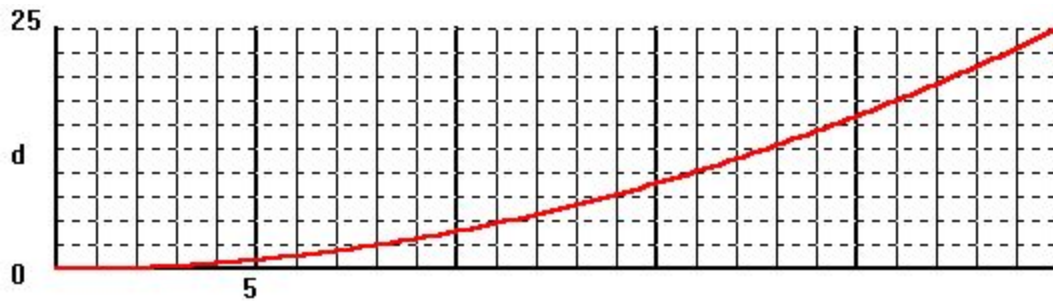
1. How many stops were made?
2. What was the maximum displacement from the start line?
3. What was the velocity of the toy car in the first 5 seconds?
4. What was the maximum velocity of the toy car?
5. What was the total distance driven?
6. What was the average speed of the entire trip?
7. What was the average velocity of the entire trip?

**Exercise 2:** The following graph shows the velocity of a toy car versus the time. Answer the following questions based on this graph. Assume that the object starts from a position of  $d = 0$  m. Show all calculations.



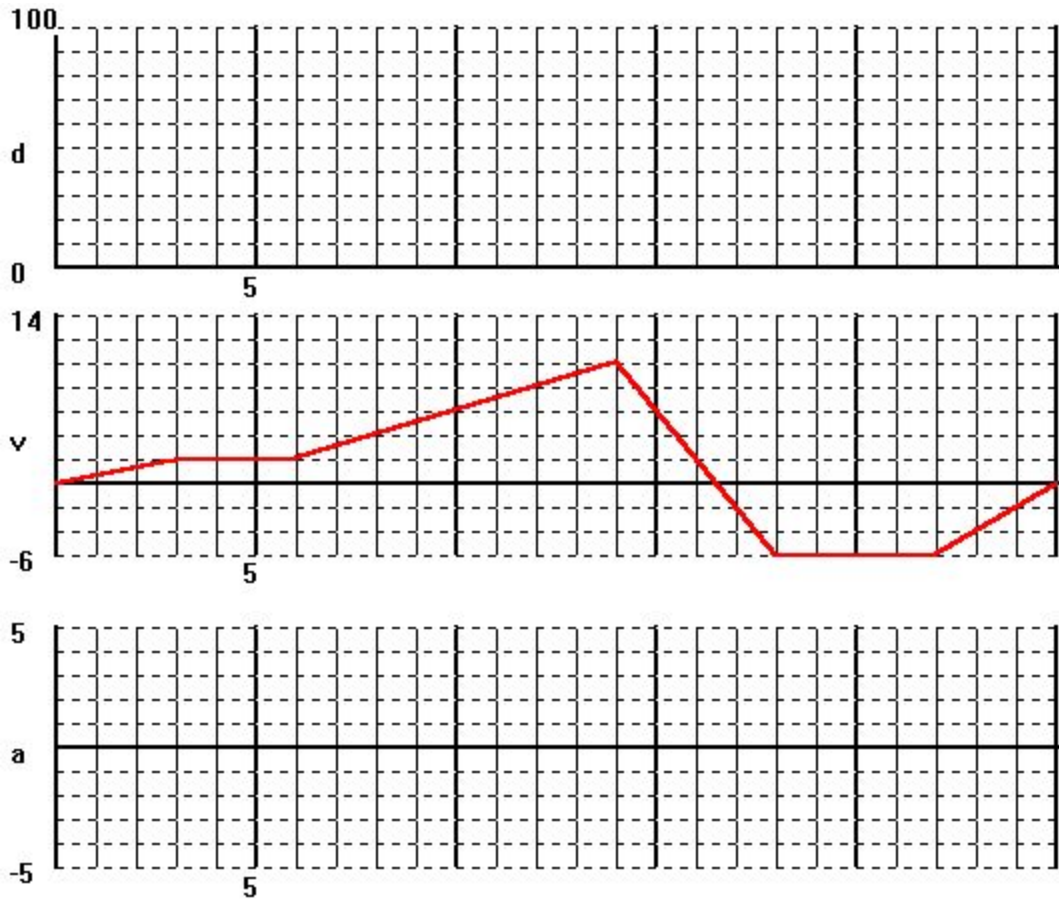
1. How far did the toy car travel from 0 to 4s?
2. How far did the toy car travel from 12 to 25s?
3. How far was the whole trip?
4. What was the average velocity for the whole trip?
5. In which section was the acceleration the greatest?

**Exercise 3:** The following graph shows the position of a toy car versus the time. Answer the following questions based on this graph. Show all calculations.



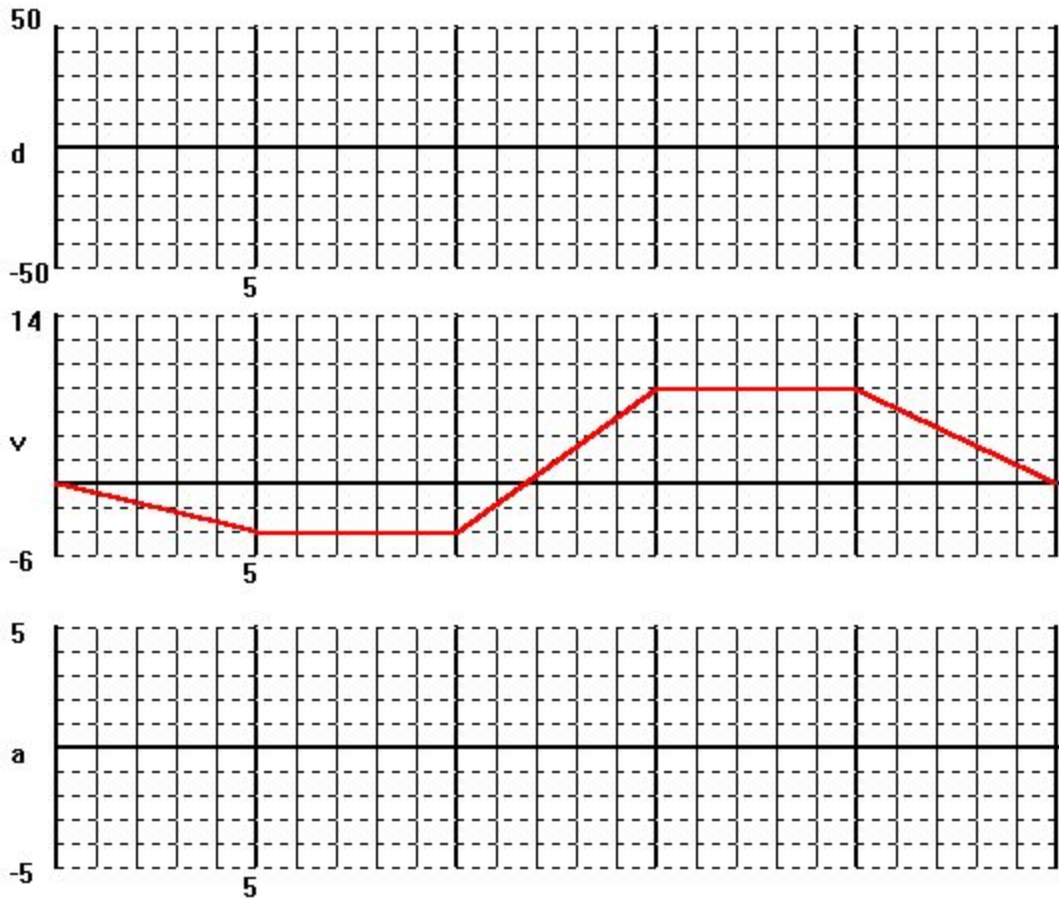
1. Determine the instantaneous velocity of the toy car at 5s, 10s, 15s, 20s and 25s?
2. Plot a graph of the instantaneous velocity versus the mid-interval time?
3. Determine the slope of the graph? What does this slope value represent?

**Exercise 4:** The following graph shows the velocity of a toy car versus the time. Answer the following questions based on this graph. Show all calculations.



1. Apply the rules for interpreting and plotting graphs to draw the position-time and acceleration-time graphs from the velocity-time graph provided. Assume that the object starts from a position of  $d = 0$  m. Show all your calculations.

**Exercise 5:** The following graph shows the velocity of a toy car versus the time. Answer the following questions based on this graph. Show all calculations.



1. Apply the rules for interpreting and plotting graphs to draw the position-time and acceleration-time graphs from the velocity-time graph provided. Assume that the object starts from a position of  $d = 0$  m. Show all your calculations.