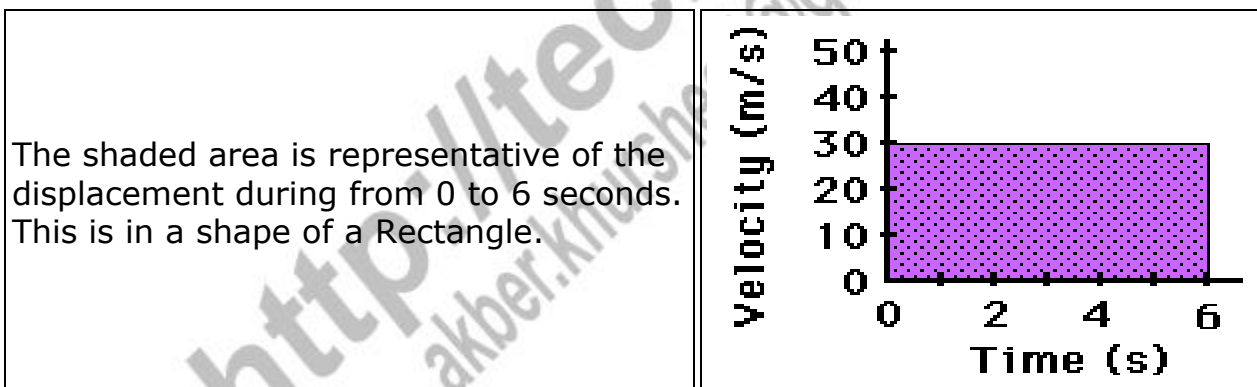


## **Determining the Area on a Velocity & time Graph:**

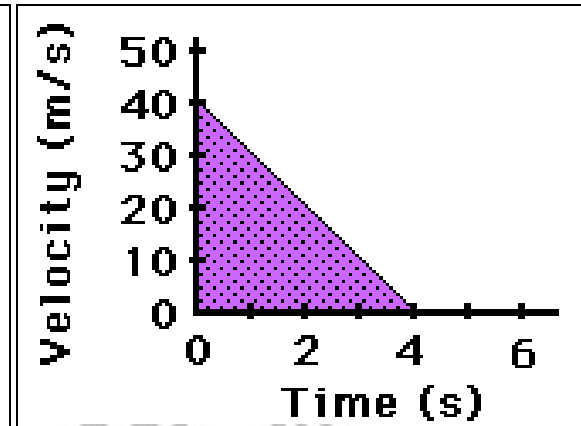
The velocity-time can be used to determine the acceleration of an object (the slope). Same graph can also be used to determine the displacement of an object.

In velocity and time graphs, the area bound by the line and the axes represents the displacement.

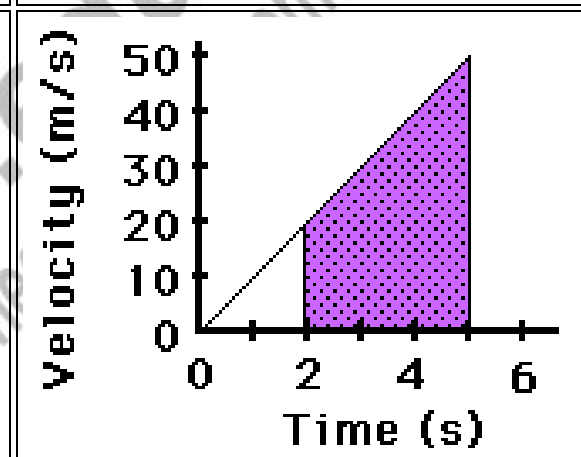
The diagram below shows three different velocity-time graphs; the shaded regions between the line and the time-axis represent the displacement during the stated time interval.



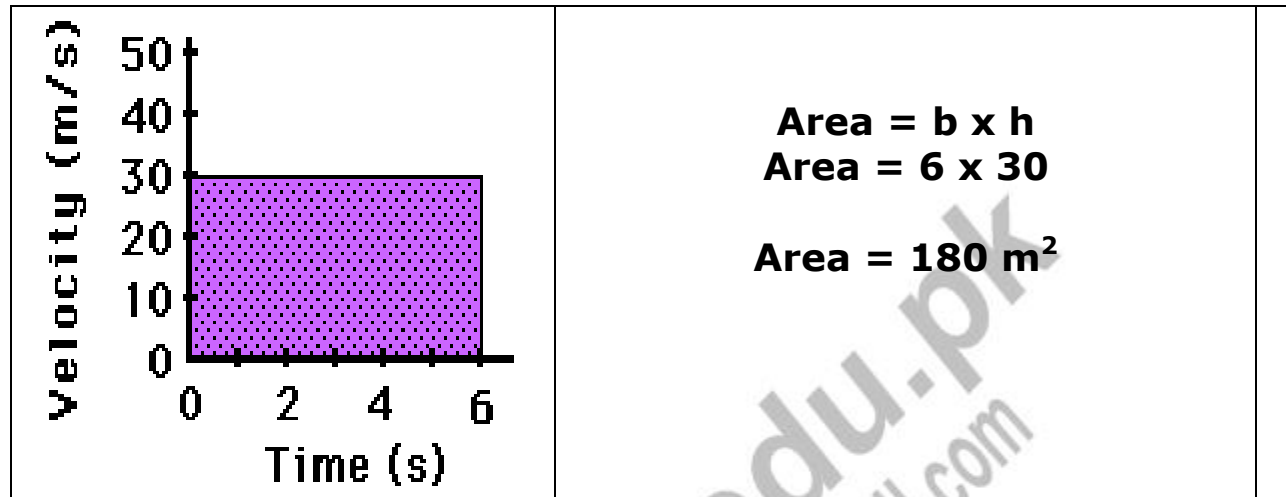
The shaded area is representative of the displacement during from 0 to 4 seconds. This area is in the form of triangle. Area of the triangle can be calculated using the formula.



The shaded area is representative of the displacement during from 2 to 5 seconds. This area takes on the shape of a trapezium which can be calculated by the formula.



The method used to find the area under a line on a velocity-time graph depends upon whether the section bound by the line and the axes is a rectangle, a triangle or a trapezoid. Area formulas for each shape are given below.



Rectangle

$$\text{Area} = b \times h$$

Triangle

$$\text{Area} = \frac{1}{2} \times b \times h$$

Trapezoid

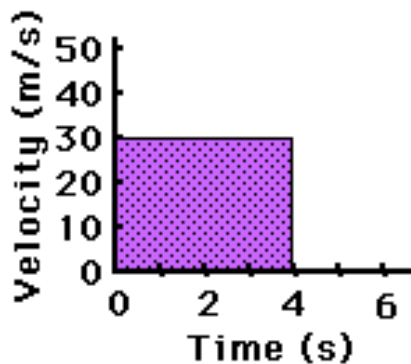
$$\text{Area} = \frac{1}{2} \times b \times (h_1 + h_2)$$

## Calculating the Area of a Rectangle OR Shaded Region:

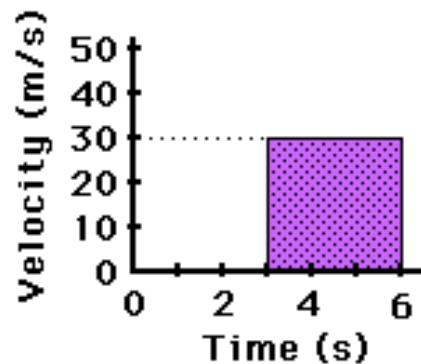
Now we consider the calculation of the area for a few rectangles. The solution for finding the area is shown below. The shaded rectangle on the velocity-time graph has a base of 6 s and a height of 30 m/s. By using the formula for area of rectangle we can find the area of the shaded region.

The following are the practice problems.

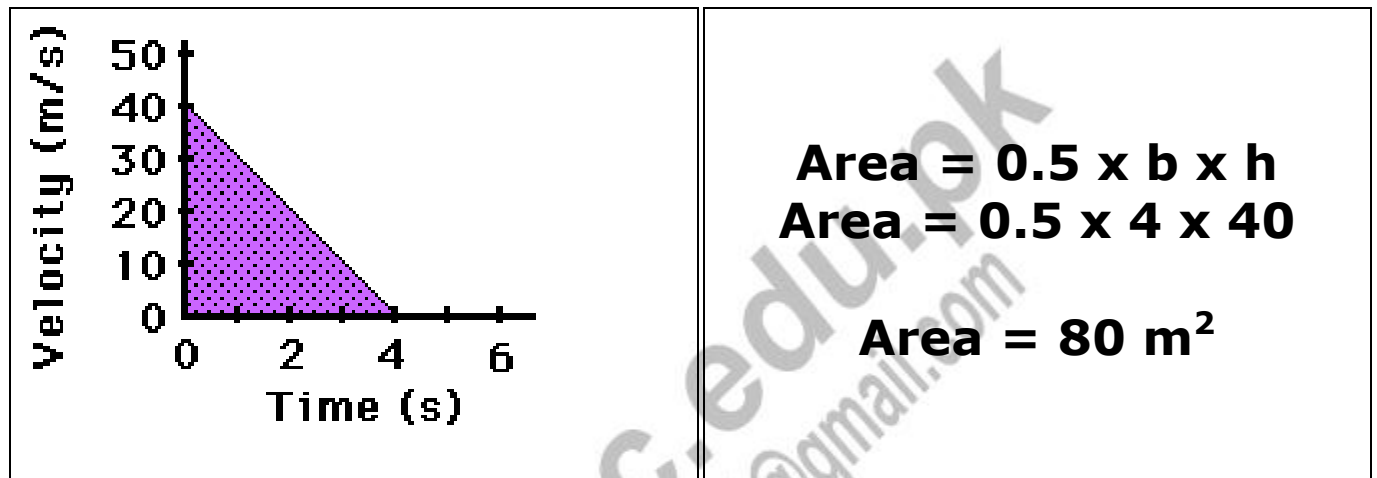
**Practice A**



**Practice B**

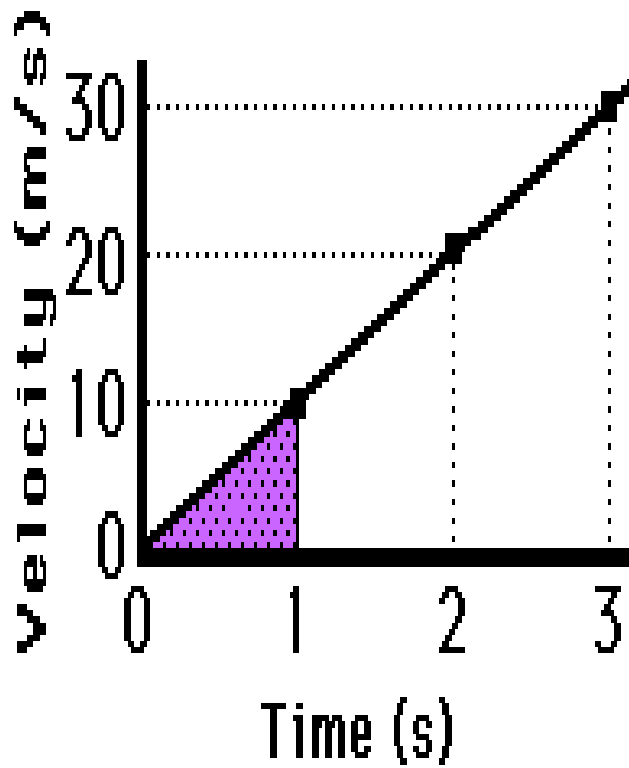


## Calculating the Area of a Triangle:

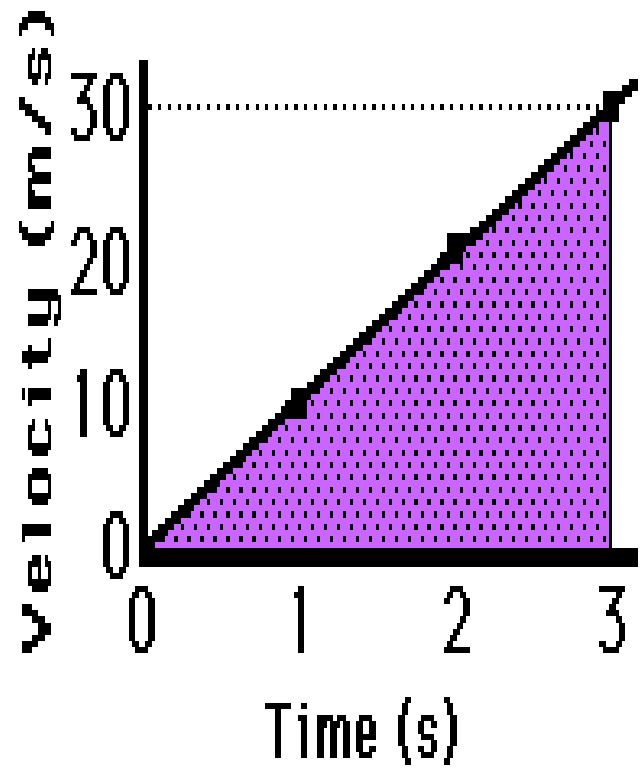


Practice questions to determine the displacement of the object:

**Practice A**



**Practice B**



For complete SLO's Preparation email to: [akber.khursheed@gamil.com](mailto:akber.khursheed@gamil.com)