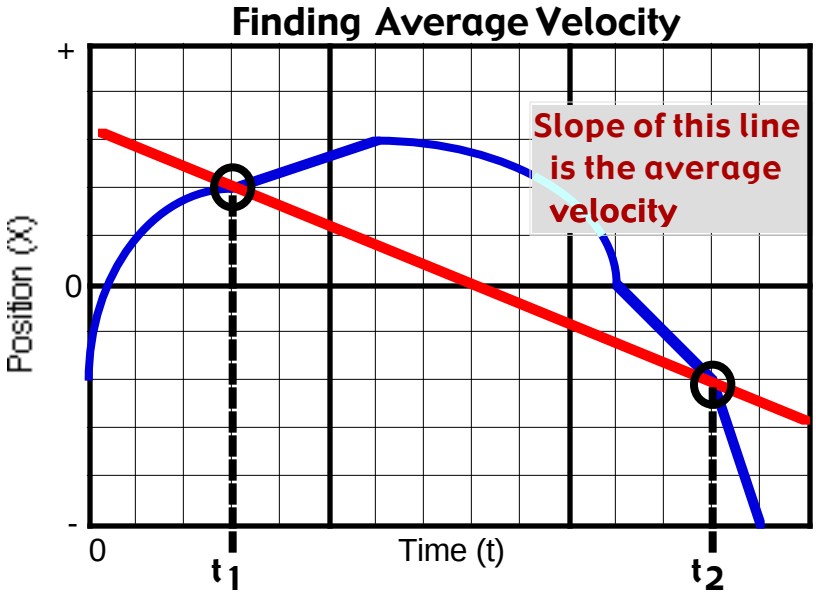
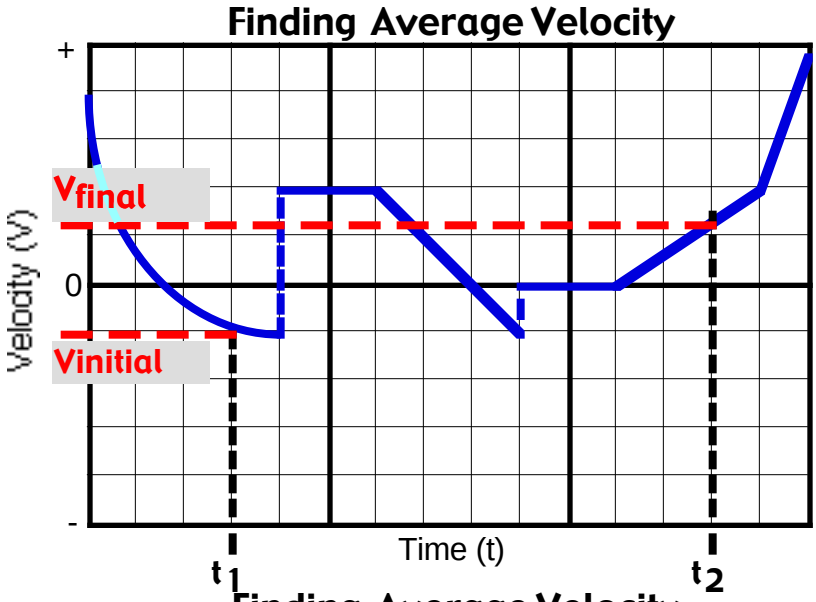
Average velocities are always described with 2 points in time. Example: "Find the average velocity from 4 to 6 seconds."



The average velocity is found by:

- Finding the 2 points on the curve at the 2 points in time, t_1 & t_2.
- Draw a line between the two points.
- Find the slope of the line. The slope is the average velocity.

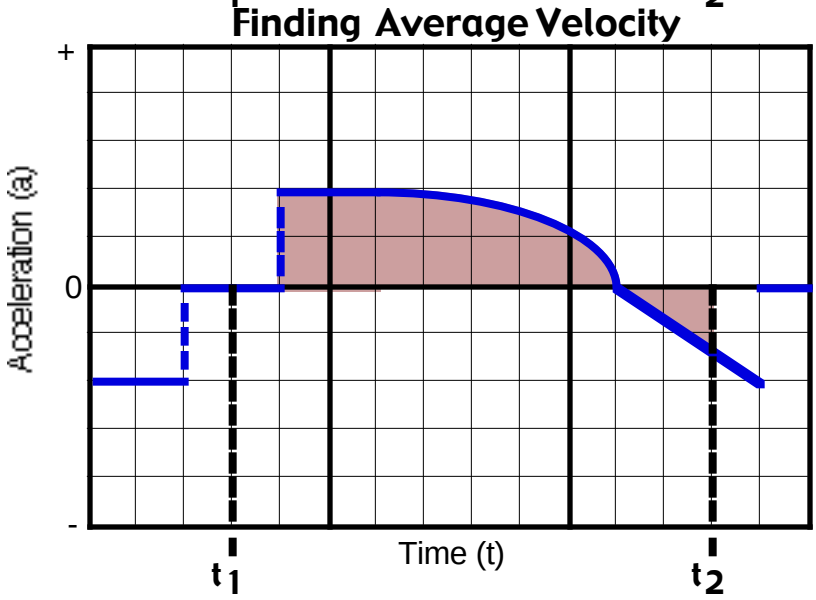


The average velocity is found by:

$$v_{AVG} = \frac{v_{FINAL} - v_{INITIAL}}{2}$$

From a *v vs t* graph:

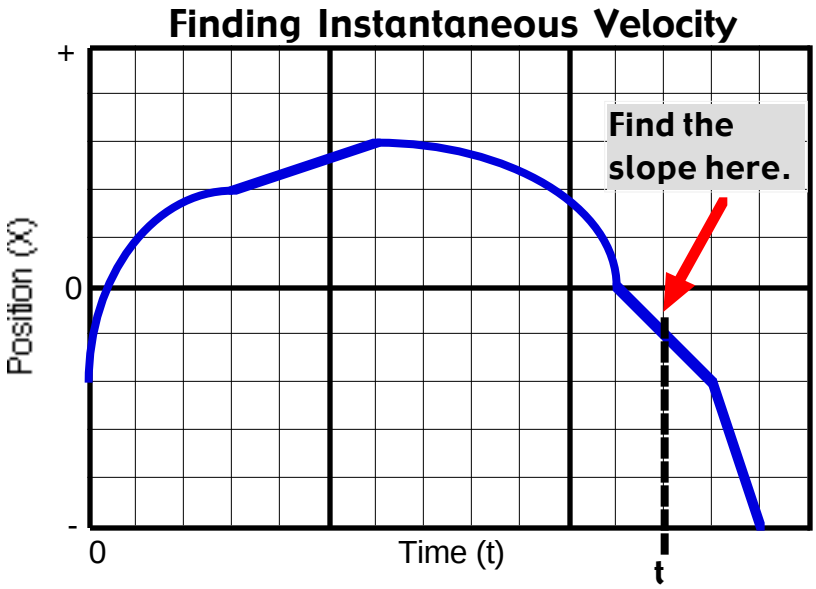
- Read the two velocities from the vertical axis.
- Add them up.
- Divide by 2.



The average velocity is found by

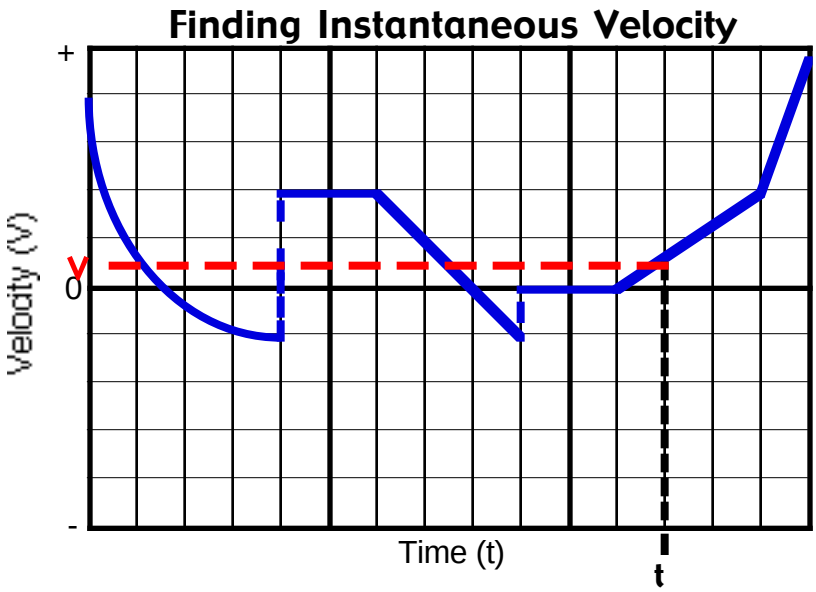
calculating the "AREA" between the curve and the axis from t_1 to t_2.

INSTANTANEOUS velocities are always described with <u>1 point in time</u>. Example: "Find the velocity at 6 seconds."

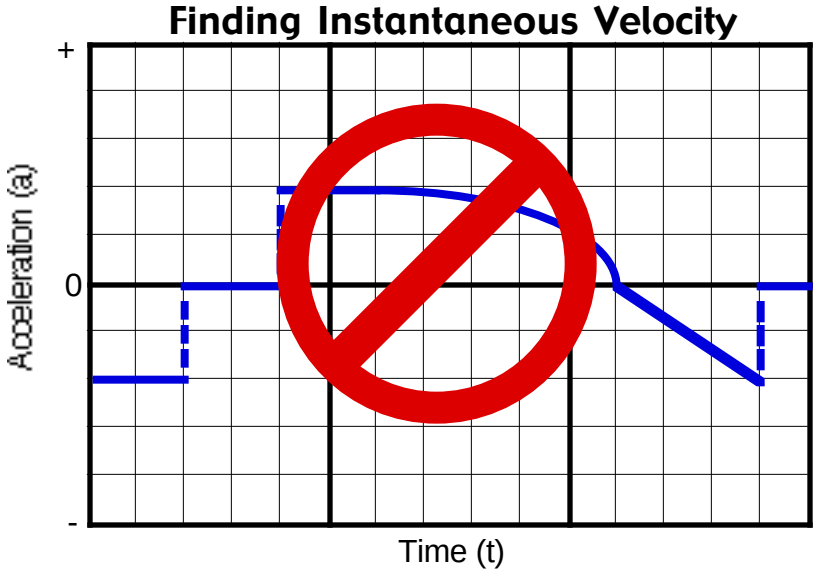


The instantaneous velocity is the slope at that point in time.

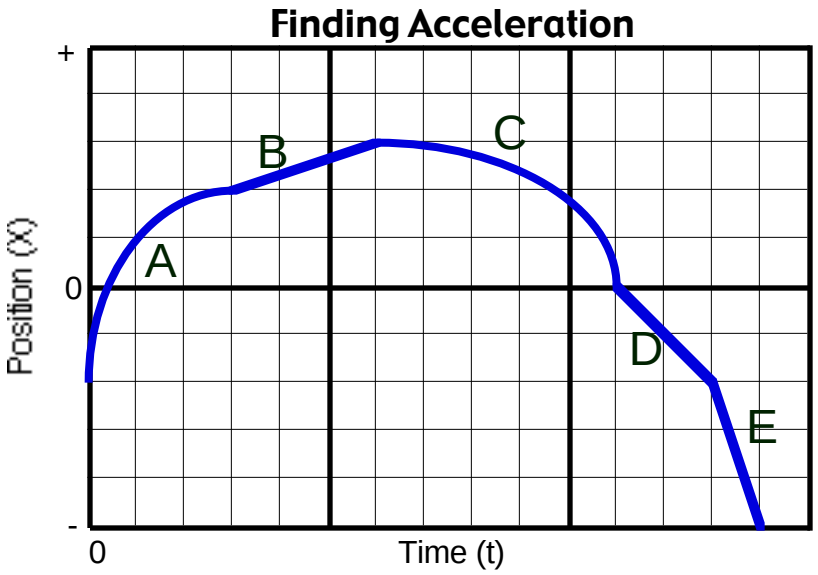
(If you are given a curve find the slope of a tangent line.)



Read the graph's vertical axis at time **t**.



N/A



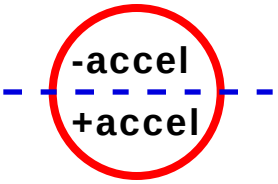
Since

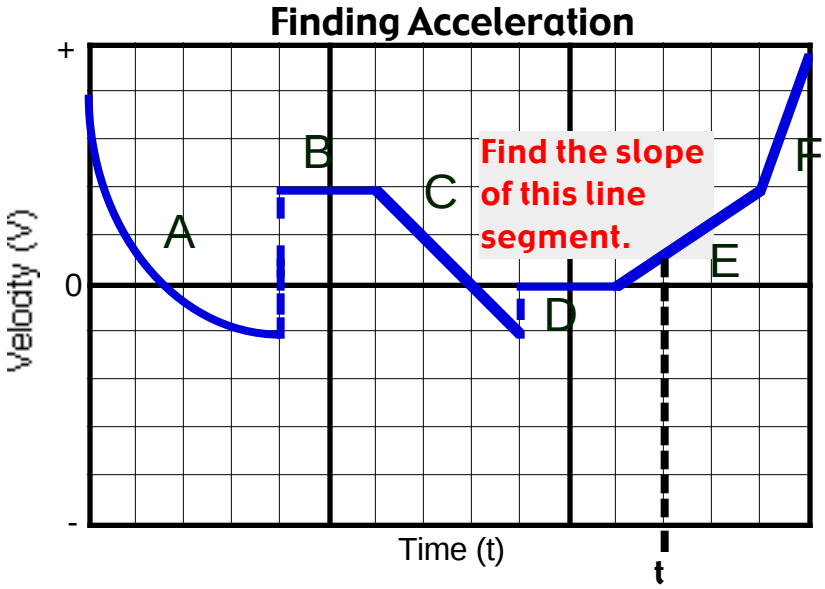
$$\text{Acceleration} = \frac{\Delta\text{Velocity}}{\Delta\text{time}}$$

and the slope of this graph equals the velocity, acceleration is the where the slope changes. This occurs on the curved regions.

Segments "A" and "C" are regions of acceleration.

Segments B, D &E are constant velocities.





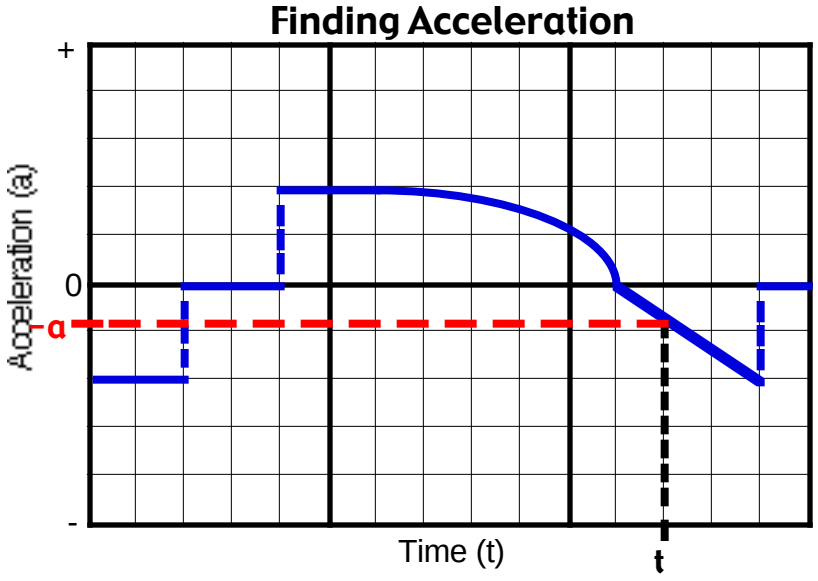
To calculate the acceleration, find the slope.

Straight lines are regions of CONSTANT ACCELERATIONS.

Line segments B, C, D, E, & F are constant accelerations.

"A" is a changing acceleration because the slope changes.

"B" and "D" are constant accelerations but have an value of ZERO.



Read the graph at time, t.