Graphing Acceleration

A **Velocity-Time Graph** shows how an object's velocity changes over time.



**Time** plotted on the x-axis.

**Velocity** plotted on the y-axis.

**Constant acceleration**: acceleration is not changing. Object is speeding up/slowing down at the same rate.

**Slope** of a Velocity-Time Graph: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Slope = rise/run = Δv/Δt = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Let's try finding a slope!**

Assume every box is 1 unit for the graph above. For example, at t1 time elapsed would be 11s because there are 11 units from t = 0s.

Find the slope from t = 0 to t1. Don't forget units and direction!

Where is the slope positive? a / b / c

This means that the average acceleration is\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Where is the slope negative? a / b / c

This means that the average acceleration is\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Where is the slope zero? a / b / c

This means that the average acceleration is\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

and that the velocity\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Find the slope from t2 to t3.

\*\*Challenge!

Find the area under the graph. To do this you multiply the velocities by their time (be careful of triangles). What do you get when you multiply the velocities by their time? Use the units as hints. Lastly, multiply this value by the total time at t3. What are the new units? What did you just find?