

Things to know about solving Word Problems with Graphs:

Velocity is equal to the area under an acceleration time graph.

Displacement is equal to the area under a velocity time graph.

For the most part graph shapes are rectangles, triangles and trapezoid

Areas:

	<u>Velocity Time Graph</u>	<u>Acceleration Time Graph</u>
Rectangle = bh	=(velocity)(time)	=(acceleration)(time)
Triangle = $\frac{1}{2}$ bh	= $\frac{1}{2}$ (time)(max velocity)	= $\frac{1}{2}$ (time) (max acceleration)
Trapezoid = $\frac{1}{2}$ b(h <sub>1</sub> +h <sub>2</sub> )	= $\frac{1}{2}$ (time)(v <sub>min</sub> +v <sub>max</sub> )	= $\frac{1}{2}$ (time)(a <sub>min</sub> + a <sub>max</sub> )

To find the time it takes for an object to catch up to another one, set the displacements (areas) equal.

To find the time it takes to reach some displacement/distance, set the appropriate shaped area formula equal to the named displacement.

To find the displacement at a given time, use the appropriate velocity time graph area formula and plug in the given times.

To find a velocity at a given time, use the appropriate acceleration time graph area formula for a given time.

To find the time to reach a given velocity, set the appropriately shaped area formula for a acceleration time graph equal to named velocity.