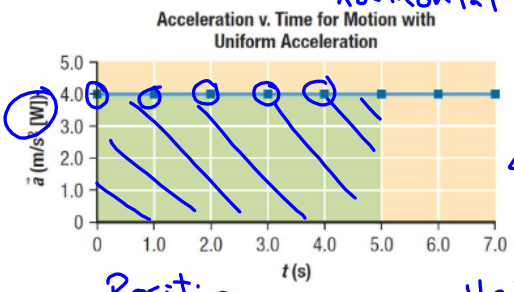
SPH3U: 1.4 Comparing Graphs of Linear Motion

1. Acceleration-time graphs

Acceleration-time graph:

accel on the y axis, time on the x-axis

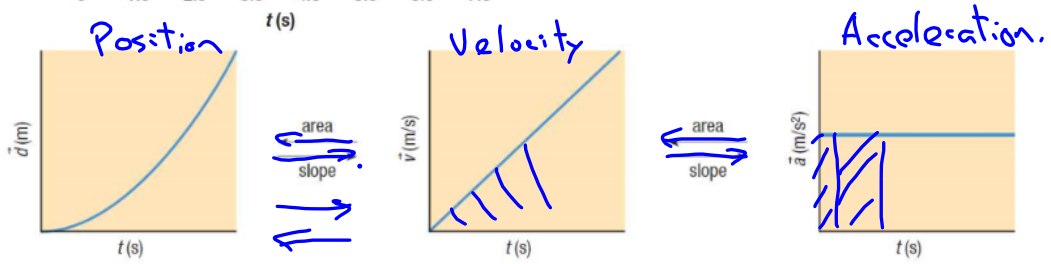
in constant accel, accel will be a straight horizontal line.



Area = bh

$= (5.0\,s)(4.0\,m/s^2)$

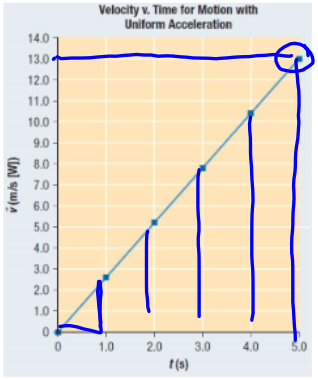
$\Delta\vec{v} = 20\,m/s\ [W]$.



Use the acceleration-time graph above to generate velocity and time data for the object. Then use these data to plot a velocity-time graph.

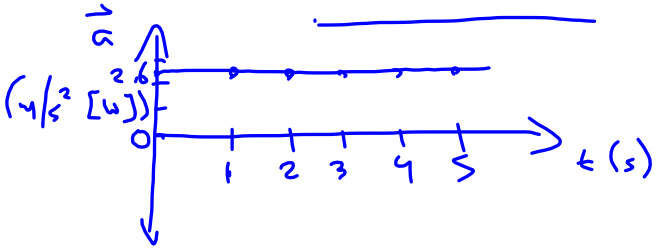
Time t (s)	Acceleration $\vec{a}$ (m/s² [W])	Equation $\Delta\vec{v} = \vec{a}\Delta t$	Velocity $\vec{v}$ (m/s [W])
0	4.0	$\Delta\vec{v} = (4.0\,m/s^2)(0\,s)$	0
1.0	4.0	$\Delta\vec{v} = (4.0\,m/s^2)(1\,s)$	4.0
2.0	4.0	$\Delta\vec{v} = (4.0\,m/s^2)(2\,s)$	8.0
3.0	4.0	$(3\,s)$	12.0
4.0	4.0	$(4\,s)$	16.0
5.0	4.0	$(5\,s)$	20.

Use the velocity-time graph shown to the right to plot the corresponding acceleration-time graph.



$\vec{a}_{av} = \frac{\Delta \vec{v}}{\Delta t} = \frac{13.0\ m/s\ [W] - 0\ m/s}{5.0\ s - 0\ s.}$

$= 2.6\ m/s^2\ [W].$



2. Summary

Homework: page 35: #1-4