

Problem Set #5 Area Under Graphs and Force vs Time Graphs  
 Due Wednesday October 17th (A/B) & Thursday October 18th (C/D)

Name: \_\_\_\_\_

I worked with:

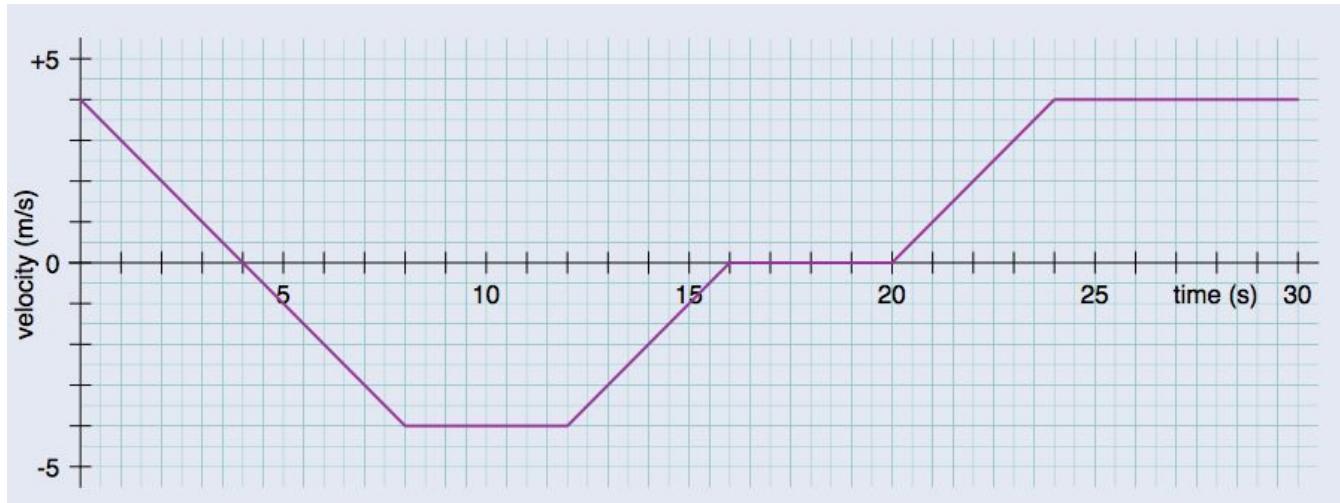
Equations:

Displacement:	$x(t) = x_0 + v_0 t + \frac{1}{2} a t^2$
Velocity:	$v(t) = v_0 + at$
Final Velocity (time):	$v_f = v_0 + at_f$
Final Velocity (displacement):	$v_f^2 = v_0^2 + 2ax_f$
Force:	$F = ma$
Acceleration due to gravity:	$9.8 \text{ m/s}^2$

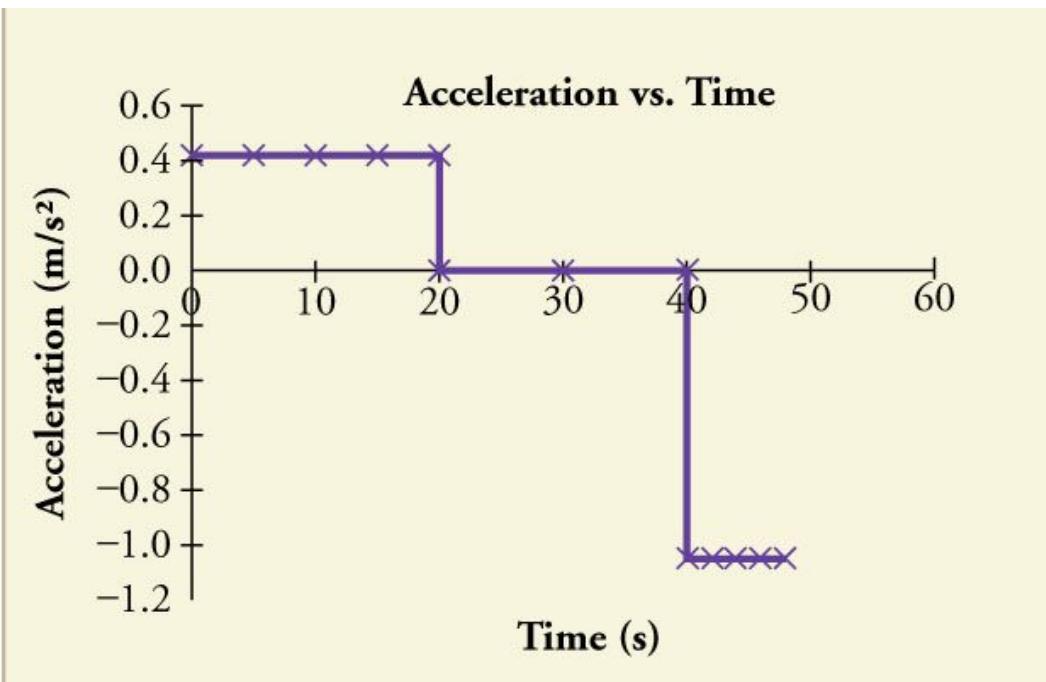
1. Fill each grid space with a concise and corresponding description

	Position vs. Time Graphs	Velocity vs. Time Graphs	Acceleration vs. Time Graphs
"Y intercept"	<b>Initial Displacement</b>		
Slope of the line (or slope of the tangent line)			
Positive Slope			
Negative Slope			
Zero Slope			
Straight			
Curved			
Area under the Curve			
Stopped when...			
Uniform Velocity			
Uniform Acceleration			

2. The graph below shows velocity as a function of time for some unknown object.
- What can we say about the motion of this object?
  - Plot the corresponding graph of acceleration as a function of time.
  - Plot the corresponding graph of displacement as a function of time



3. The graph below shows acceleration as a function of time for some unknown object.
- What can we say about the motion of this object?
  - Plot the corresponding graph of velocity as a function of time.
  - Plot the corresponding graph of displacement as a function of time



4. A stunt man with a mass of 77 kg “belly-flops” on a shallow pool of water from a height of 11 m. When he hits the pool he comes to rest in approximately 0.05 seconds. What is the average braking force that the water and the bottom of the pool exert on his body during that time interval?

5. (Honors) The “land divers” of Pentecost Island (New Hebrides) jump from platforms 21 m high. Long liana vines tied to their ankles jerk them to a halt just short of the ground.

- a. If the pull of the liana takes 0.02 s to halt the diver what is the average acceleration of the diver during this time interval?
- b. If the mass of the diver is 64 kg, what is the corresponding average force on their ankles?