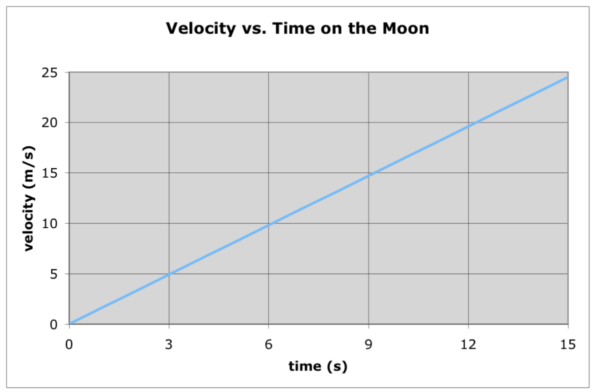
COMMENT ON PROBLEM SOLVING:

When you write up your solutions, you should have a document that is very helpful to you come exam time. A problem solution that is just some equations, a few lines of algebra, and a couple of numbers not help you study at all. When you study for an exam you want to fully understand the reasoning behind the solution and the best way to describe the reasoning is with words and pictures. You will always see me draw sketches and writing the words that explain what I am doing. I expect you to do the same thing. In summary, a proper problem solution includes:

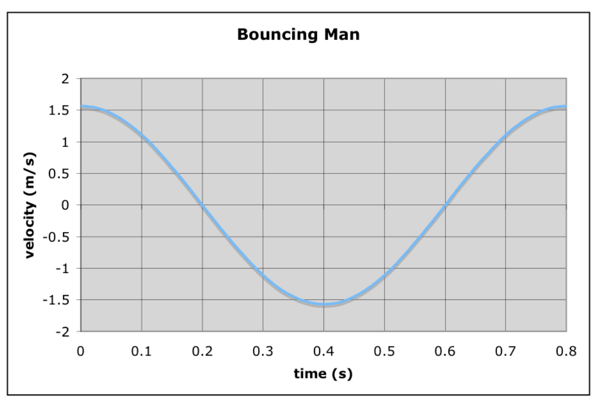
- A sketch of the important features of the problem.
- A clearly identified coordinate system, if needed.
- A list of known quantities.
- A list of the quantities you intend to find.
- The names of the relevant definitions, laws, and useful relationships you use.
- A written explanation of the reasoning required for the key steps.
- The algebra done first, then the numbers plugged in.
- A clear indication of the final answer (such as a box around it)
- A final written comment about the result.

1. The graph at the right shows the velocity as a function of time for rock falling from the top of a cliff on the moon. (a)Find the acceleration due to gravity on the moon. (b)Does the acceleration due to gravity change with time? Explain. (c)Sketch the graph for position as a function of time.



2. The acceleration due to gravity on Mars is $3.8 m/s^2$. If an astronaut on Mars drops a wrench, find the equation for (a)the velocity of the wrench and a function of time and (b)the position of the wrench as a function of time. Use coordinates that start at the height where the wrench is released and positive is downward.

3. A man is bouncing up and down on a spring (http://www.dailymotion.com/video/x33or_bouncing_creation). The graph of his velocity as a function of time for one bounce is shown at the right. Sketch the graphs of his (a)acceleration as function of time and (b)his position as a function of time assuming he starts at zero.



4. For the same man in problem 3, assume the equation that describes his position as a function of time is $x(t) = A\sin\frac{2\pi}{T}t$ where A = 19.0cm and T = 0.800s. Find the equation for his (a)velocity as function of time and (b)his acceleration as a function of time. Is your answer consistent with your graphs from problem 3?