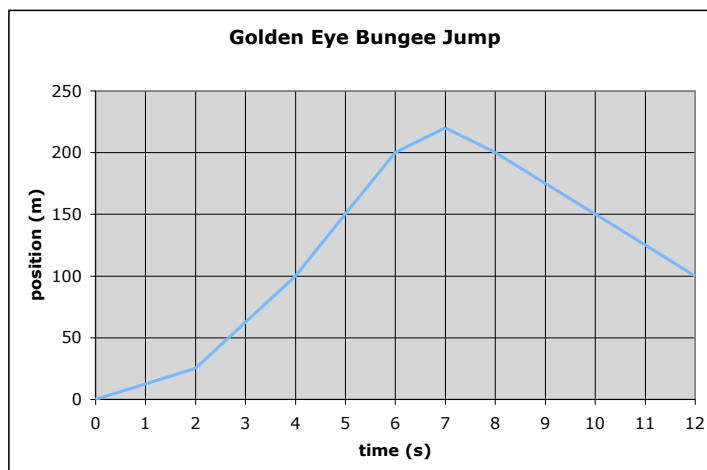


When you write up your solutions, you should have a document that is very helpful to you come exam time. A problem solution that is just some equations, a few lines of algebra, and a couple of numbers not help you study at all. When you study for an exam you want to fully understand the reasoning behind 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.
- Any 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. Find the current track and field world records for the 100m, 200m, 400m, and 800m. Use the data to find the average speed during the world record run for each event.

2. In the movie Golden Eye there is a scene of a 220m bungee jump off Verzasca Dam in Switzerland (<http://laserpablo.com/videos/videofiles/goldeneye.htm>). The graph of the position of the jumper as a function of time is shown at the right using coordinates where down is positive. Sketch the graph of velocity versus time. Be sure to estimate the actual values of velocity.



3. Use the information at NASA (<http://spaceflight.nasa.gov/shuttle/reference/basics/launch.html>) to find the average acceleration of the shuttle (a)during the 8.00 seconds after launch, (b)during the first minute after launch, and (c)the first two minutes after launch.

4. A car is moving along an icy road. The figure at the right is a graph of its velocity versus time starting at the base of a long incline. Answer the following questions:

- When is the velocity a maximum?
- What is the maximum velocity?
- When is the velocity zero?
- When is the acceleration zero?
- When is the acceleration a maximum?
- What is the maximum acceleration?
- Does the car ever begin sliding back down the incline? If so, when?

