For the week of November 24-28

1) Recall that on earth, the velocity of an object in free-fall will obey the equation $dv/dt = g$ where $g = -9.8m/s^2$. When a skydiver jumps out of a plane, there is air resistance, proportional to $1/m$ and v, where m is the mass of the object. Call the constant of proportionality k.

   (a) Write down a differential equation which models the skydiver's velocity in free-fall.

   (b) Solve this differential equation.

   (c) Assume that the skydiver jumps out of a plane at a height of 10 km. Calculate how long it will take for them to reach the ground if they do not use a parachute.

   (d) Assume that the same skydiver makes an identical jump, but on another planet, Nauvis. Assuming that the atmosphere on Nauvis is