Rocket trajectory: To calculate the rocket trajectory we use the rocket dynamic equations. We have the following assumptions to simplify the calculation without losing too much accuracy. We are having an exponential atmosphere and the air drag coefficient is constant. At each stage the burn rate and the Isp is also constant to maintain a constant thrust. To avoid changing the flight path angle too much we decide to let the rocket fly straight up for 20 second and then start to turn using the gravity which is describe by the equations. Since our satellite is way lighter than the designed mass for the falcon 9 to launch to LEO, we use 32% propellant in the first stage of the rocket. This will launch our satellite to the required altitude.