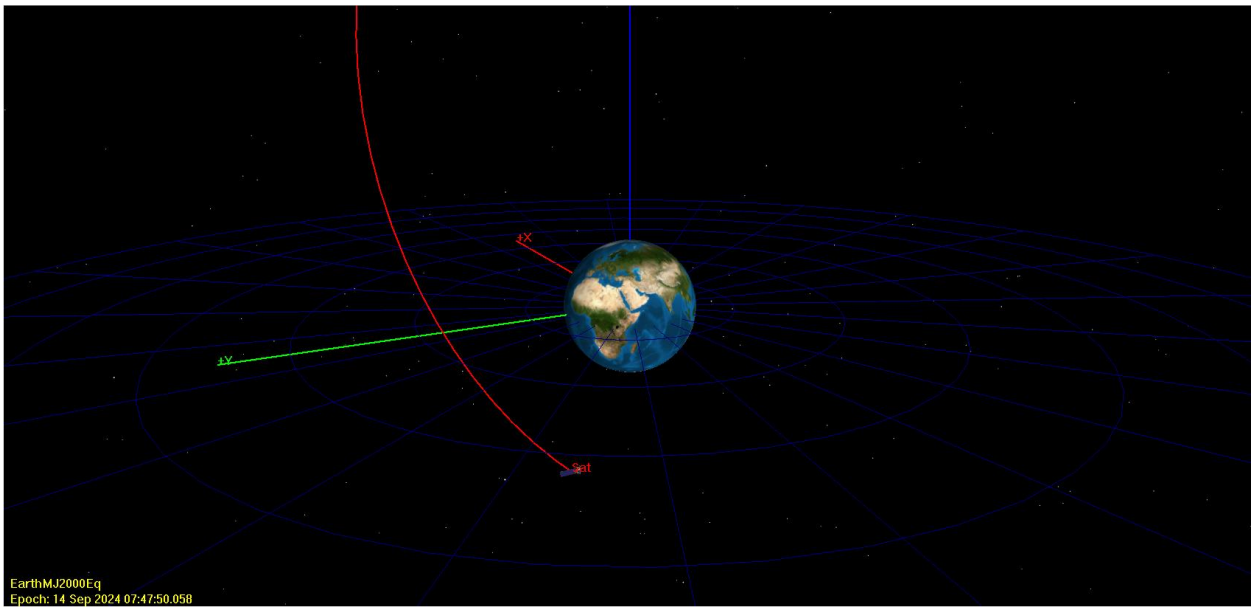
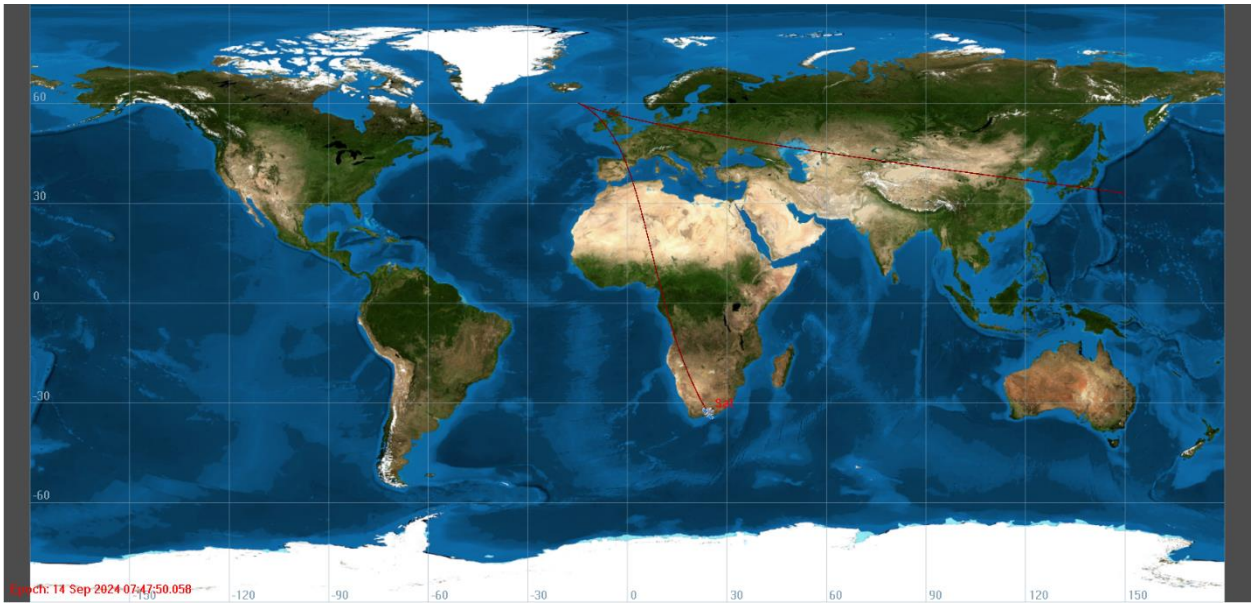
Problem 2:

a)


+X
+Y
Sat
EarthMJ2000Eq
Epoch: 14 Sep 2024 07:47:50.058


60
30
0
-30
-60
-120
-90
-60
-30
0
30
60
90
120
150
Epoch: 14 Sep 2024 07:47:50.058

i-vi)

Parameter	Values	Units
Radius at closest approach or Rad. Peri.	18000	km
Radius at farthest excursion or Rad. Apo.	102000	km
Energy	-3.321670346	km^2/s^2
Semi-major axis	60000	km
Semi-latus rectum	30600	km
Angular momentum magnitude	110440.8145	km^2/s
Cartesian X	60339.78352	km
Cartesian Y	-60624.8747	km
Cartesian Z	55567.39235	km
Cartesian X Velocity	0.123519703	km/s
Cartesian Y Velocity	0.791054225	km/s
Cartesian Z Velocity	0.728924094	km/s

The cartesian position and velocities are associated with the **EarthMJ2000Eq** reference frame, which is an Earth equator inertial system. The units are given in the table above. Raw data is shown in an attached .txt file.

b)

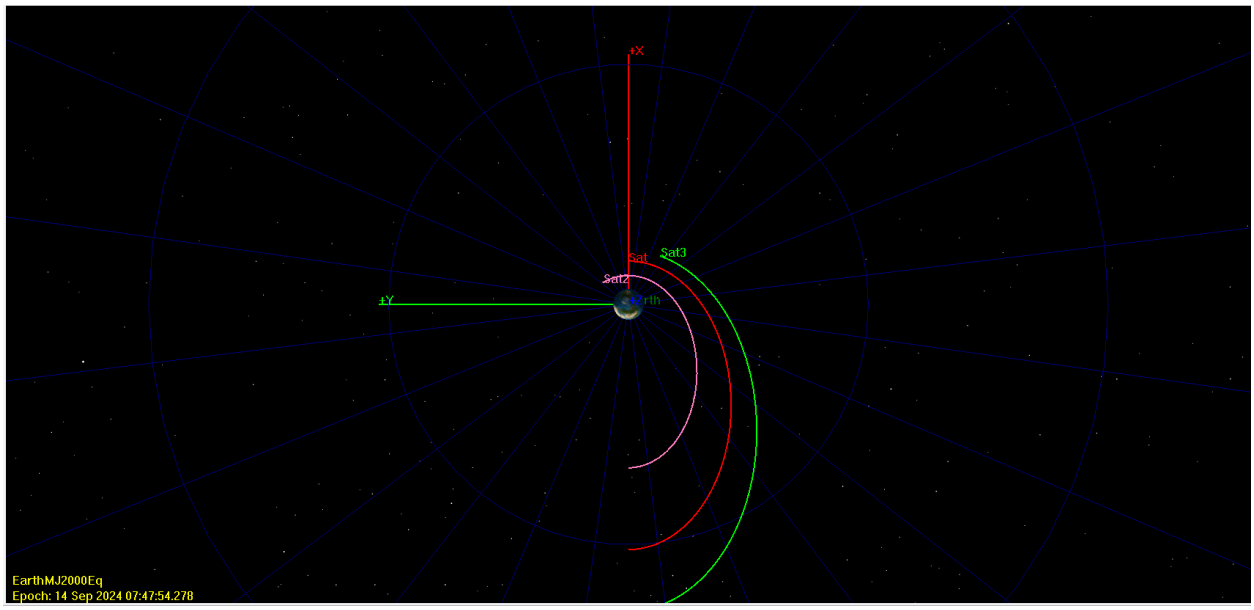


Figure 1: e = 0.7, a = 40,000 km, 60,000 km, 75,000 km

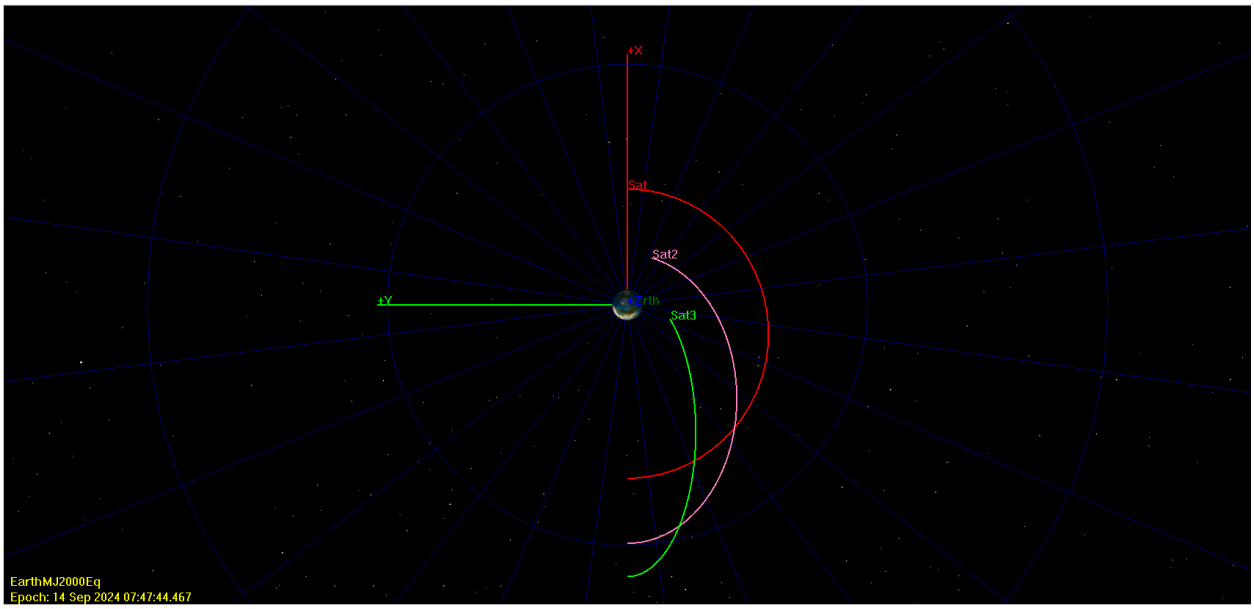


Figure 2 : a = 60,000 km, e = 0.2, 0.65, 0.88

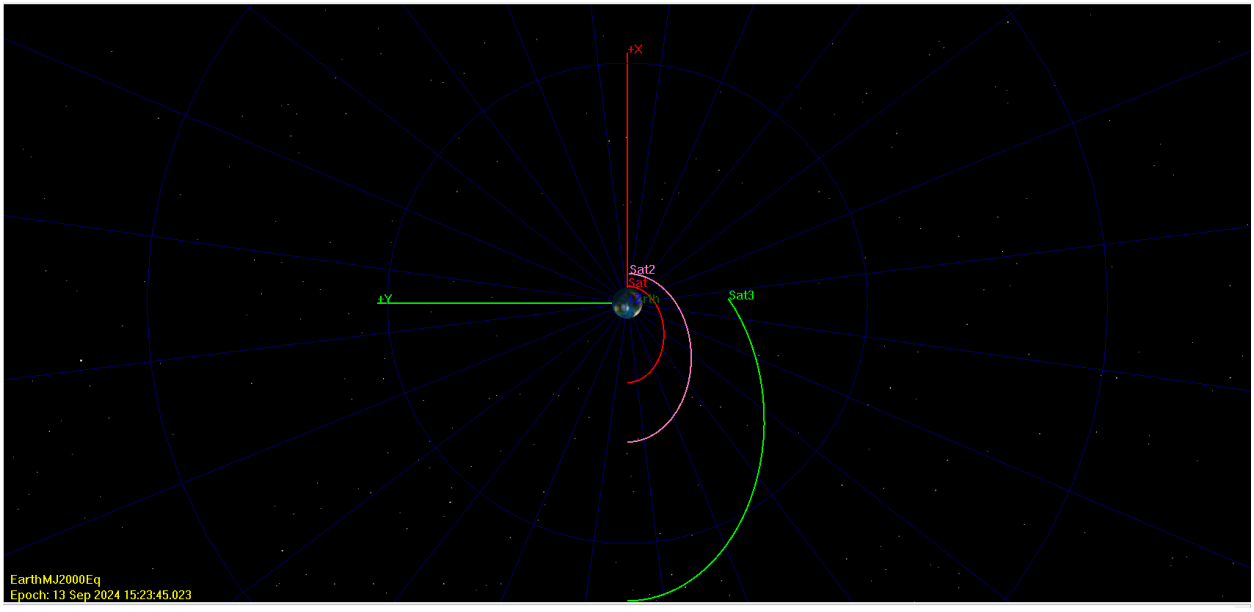


Figure 3: e = 0.65, a = 20,000 km, 35,000 km, 75,000 km