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Problem 1 Part a
inclination angle i at t1 = 62.09 deg
semi-major axis a at t1 = 662780.88 Km
e at t1 is 0.91021
RAAN at t1 is 127.45 deg
Argument of Periapsis w at t1 = -172.28 deg

Given Ralative 2BP assumptions we can use t1 orbital elements to calculate impact values
True Anomaly at impact = -13.17 deg
R vector in XYZ frame at impact is <34355.5200,-49258.0066,5057.5543> Km
V vector in XYZ frame at impact is <12.5761,10.2611,-30.6325> Km/s

Problem 2 Part b
Orbital Period is 4.37 hours
Periapsis Altitude is 128.5443 Km

Problem 2 Part c
R vector in XYZ frame is <-8745.4758,-702.5523,-1904.3574> Km
V vector in XYZ frame is <0.7983,-0.3778,-1.4663> Km/s

inclination angle i = 74.92 deg
semi-major axis a = 6463.80 Km
e is 0.45454
RAAN is 1.24 deg
Argument of Periapsis w = -6.69 deg
True Anomaly ThetaStar = -160.62 deg

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