
Table of Contents

Homework 1	1
Clean up	1
Part 1	1
Part 2	1
Part 3	1
Part 4	2
Part 5	2
Part 6	2
Functions	3

Homework 1

Liam Hood Aero 351

Clean up

Part 1

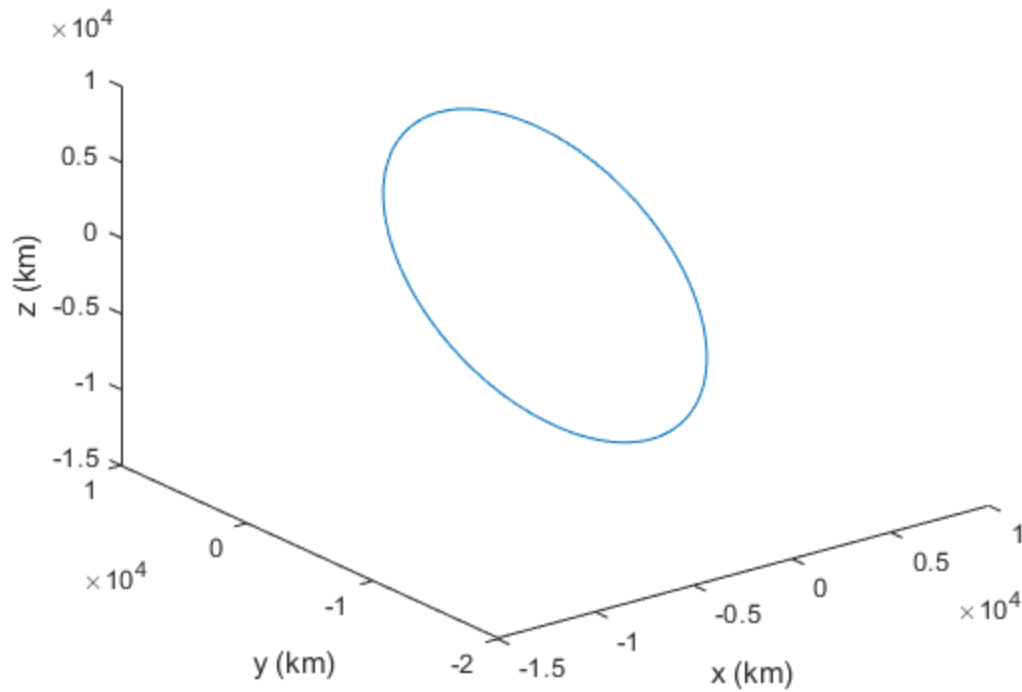
1
Julian Date of 22 9 2018 at 12:0:0 UT is
2458384

Part 2

2
a
The LST at 144.9667 degrees east at 21 12 2007 at 10:0:0 is
23.2592 degrees
b
The LST at -120.653 degrees east at 4 7 2018 at 12:0:0 is
325.4526 degrees

Part 3

3. Curtis 2.4
Position after 24 hours is 3207 3202.0694 3197.1367km
Radius is 5546.1501 km
Velocity after 24 hours is 3192.2016 3187.2644 3162.5452 km/
s
Speed is 5509.1286 km/s



Part 4

4. Curtis 2.10

Start with velocity component equations

$v = \sqrt{v_r^2 + v_{az}^2}$ and $v_{az} = (\mu/h) * (1 + e * \cos(\theta))$ and $v_r = (\mu/h) * e * \sin(\theta)$

Then combine into single v equation and simplify

$v = \sqrt{((\mu/h) * (1 + e * \cos(\theta)))^2 + ((\mu/h) * e * \sin(\theta))^2}$

$v = \sqrt{(\mu/h)^2 * (1 + 2 * e * \cos(\theta) + e^2 * \cos^2(\theta) + e^2 * \sin^2(\theta))}$

$v = (\mu/h) * \sqrt{1 + 2 * e * \cos(\theta) + e^2 * (\cos^2(\theta) + \sin^2(\theta))}$

$v = (\mu/h) * \sqrt{1 + 2 * e * \cos(\theta) + e^2}$

Part 5

5. Curtis 2.17

The period of the orbit is 1.8141 hours

The speed of the orbit is 3.454 km/s

Part 6

6. Curtis 2.21

a

The eccentricity is 0.81818

b

The semi-major axis is 55000 km

c

The period is 35.6577 hours

d

The specific energy of the orbit is $-3.6236 \text{ km}^2/\text{s}^2$

e

The true anomaly when the satellite is at an altitude of 10,000 km is 82.2638 degrees

f

The azimuthal velocity is 5.1979 km/s

The radial velocity is 2.1072 km/s

g

The velocity at perigee 8.5131

The velocity at apogee 0.85131

Functions

Published with MATLAB® R2017b