16.346 Astrodynamics
Fall 2008

# Exercises 14

1. In Lecture 13, Page 3 calculate the second derivative of $Q(x)$ and show that $Q$ is a solution of Gauss' Differential Equation. Also, determine the numerical values for $\alpha$, $\beta$ and $\gamma$.
2. Carefully, follow the proof on **Pages 62–63** that the continued fraction for $Q(x)$ converges for $-\infty < x < 1$.
3. Do Problem 1–6 in the textbook.
4. Use the Top-Down Method to find values for $\tan x$.
5. Evaluate the Golden Section $\frac{1}{2}(1+\sqrt{5})$ using the Top-Down Method.
   [See Equation (1.26) in the textbook.]
6. Show that
$$\frac{\log(1+x)}{x}$$
   is a hypergeometric function by showing that it is a solution of Gauss' Differential Equation.