

## Brief answer to selected problems in Homework 09

1. Section 4.7:

Problem 18: Solve, for example,  $f(x) = \tan(\frac{x}{4}) - 1 = 0$ .

Problem 29: The solution:  $x_* = 1$ . Newton's method:  $x_{n+1} = x_n - \frac{x_n - 1}{40}$ . Therefore the error between  $n$ th and  $(n + 1)$ th iteration is given by  $x_{n+1} - x_* = \frac{39}{40}(x_n - x_*)$ . It takes about  $\frac{3}{\log_{10}(\frac{40}{39})} \approx 118$  iterations.

Problem 30: Combine  $r\theta = 3$  and  $r \sin(\frac{\theta}{2}) = 1$  to get  $f(r) = r \sin(\frac{3}{2r}) - 1 = 0$  and solve for  $r$ .

2. Section 4.8:

Problem 84: (b) and (c).

Problem 128: Yes. Since  $F - G$  is a constant and  $F(y_0) - G(y_0) = 0$ .