1) Write a function \([\text{to, xo}] = \text{rkf}(a, b, h, M, \text{del}, x_a)\) based on the Runge-Kutta-Feldberg pseudocode on page 545 of the text to solve an initial value problem defined by \(x' = f(t, x)\) on the interval \([a, b]\) with initial condition \(x(a) = x_a\). The input to the function should be the parameters \(a, b, h, M, \text{del}\) and the initial value \(x_a\). You may build the function \(f\) into the body of RKF, or call an external function \(f\). For each step \(k\), the program should print \(k, t, x, e, h\), where \(e\) is the estimated error as computed by eqn (12) on page 544. Print 10 digits for \(x\) and \(e\), and 6 digits for \(t\) and \(h\). Note that the pseudocode in the book seems to have forgotten to advance the counter \(k\).

2) Write a driver program that solves the initial-value problem defined by \(f(t, x) = (tx - x^2)/t^2\) on the interval \([1, 3]\) with initial condition \(x(1) = 2\). The true solution \(x(t)\) for this problem is given in Example 1 in Sect. 8.3 of the book. Also print the maximum difference between the true solution \(x\) and your computed solution at the chosen points \(t_i\), and plot the piecewise linear interpolant corresponding to your solution.

3) Run the following cases with \(M = 100\) and \(\text{del} = .000000001\):
   a) \(h = .5\)
   b) \(h = .1\)
   c) \(h = .01\)
   d) \(h = .00001\) Note: there are 4 runs to this problem. Each run will produce 5 columns of output and a maximum error value.