MACM 316 – Spring 2005: Assignment 5

Web Site: www.cecm.sfu.ca/~hle/teaching/MACM316/

Due: Monday, April 4

R.L. Burden, J.D. Faires. Numerical Analysis, seventh edition.

Section 4.1: 3a, 4a.

Section 4.2: 8, 13a (the first part).

Section 4.3: 1c, 2c, 7, 13.

Section 4.4: 4.

Section 4.5: 7.

Section 4.6: 2a.

Section 5.1: 1a (no need to find the solution), 5.

Section 5.2: 1a, 2a.

Implement Euler's method in Maple.

```
EulerMethod := proc(ode,yoft,rangeoft,alpha,N)
    ...
end proc:
```

The output from EulerMethod is of the from

$$[[t_0, w_0], [t_1, w_1], \ldots, [t_{N-1}, w_{N-1}], [t_N, w_N]]$$

where w_i approximates $y(t_i)$ for $0 \leq i \leq N$. Let

```
ode := diff(y(t),t)=y(t)*(2.5*t-t^2*sqrt(y(t)));
```

Run your program with the following input:

- EulerMethod(ode,y(t),0..2.,1.,5);
- EulerMethod(ode,y(t),0..2.,1.,20);
- EulerMethod(ode,y(t),0..2.,1.,40);

Section 5.3: 1a, 2a.

Section 5.4: 10a.

Section 5.10: 1.