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Numerical Analysis I
Homework and Project Schedule

MATH 464
Autumn 1999

Homework Schedule

DATE	ASSIGNMENT (from Johnson Riess)
Oct. 1	§1.3: 1b(iii, iv), 4(replace hex with binary), 8, additional problems I
Oct. 8	additional problems II and III; §2.1: 4, 6, 10, 11; §2.2.4: 4, 5, 9, 10, 16, 19
Oct. 15	§2.3: 3, 7, 8, 9, 12a, 12b; §2.4: 5, 7, 8, 9, 13
Oct. 22	§2.5: 1, 3, 4, 5a, 6a, 7
Oct. 28	§4.3.1: 1, 4, 6, 9; §4.3.2: 5; §4.3.3: 2, 7, 9, 12
Oct. 29	MIDTERM
Nov. 5	§4.4.1: 2, 3, 4
Nov. 12	§5.1: 4; §5.2.1: 1a, 3a, 4a, 11
Nov. 19	§5.2.2: 1, 2, 5, 8, 10; §5.2.4: 3abd, 5, 6, 10, 13
Nov. 24	§5.2.6: 1, 3; §6.2.2: 2, 3, 4, 8, 9, 14
Dec. 3	§6.2.4: 7, 9, 10, 11
Dec. 14	8:30-10:20 a.m., FINAL EXAM

Project Schedule

DATE	TOPIC
Oct 22	Tridiagonal linear systems
Nov. 5	Gauss-Seidel method
Nov. 19	Newton's method, fixed point iteration and the secant method
Dec. 6	Polynomial interpolation

Additional Problems:

I. **(Due Oct. 1)**

i. **Discover or deduce how the numbers 1/2, 2/3 and 3/5 are represented internally on some computer or calculator you use. Use an appropriate notation, i.e. binary, decimal, hexadecimal, etc. You will have to give both an exponent and a mantissa.**

ii. **Consider the following "program"** (it might be in fortran, matlab, S-Plus, C or other language, though the particular languages assignment operator might have to be substituted for "=", i.e. in S-Plus "<-" means assign)

```
H=1./2.
X=2./3.-H
Y=3./5.-H
E=(X+X+X)-H
F=(Y+Y+Y+Y+Y)-H
Q=F/E
"OUTPUT" Q
```

The variable Q can take on several different values depending on the floating-point arithmetic hardware used by the computer or calculator. Try to figure out the value of Q for some computer you are familiar with, preferably the same one you used in the previous part. Run the "program" on that computer and explain your results. If you use a computer for this, your write up of your solution should specify what computer, what language, include a copy of the "program" as it was used on the computer and the results and your explanation. If you use a calculator, give as much of this information as makes sense in that setting.

II. (Due Oct. 8) Describe a method to compute $f(x) = (1 - \cos x)/x$ when $|x|$ is small.

III. (Due Oct. 8) Desribe a method to compute $g(x) = (\log x - 1)$, when x is close to e.

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Back to the Math 464 Home Page