

MATH 3P60 FIRST MIDTERM OCTOBER 17, 2005

Full credit given for two correct and complete answers.

If possible, use Maple 8. Save your work in *.mws format.

Open-book exam.

Duration: 50 minutes

1. Find Newton's interpolating polynomial for

x	-3	-1	0	2	5	9
y	6	2	-1	4	12	18

2. Using the previous table, find a , b , c and d to minimize

$$\sum_{i=1}^6 [y_i - (a + b \cdot x_i + c \cdot \sin x_i + d \cdot \cos x_i)]^2$$

The corresponding set of normal equations must be solved by Gaussian elimination with backward substitution and full pivoting (show all steps of the procedure).

3. Find a , b , c , d and e to minimize

$$\int_{-1}^3 \left[\frac{1}{1+x^2} - (a + b \cdot x + c \cdot x^2 + d \cdot x^3 + e \cdot x^4) \right]^2 dx$$

Find the typical error of the corresponding fit.