

Maple Workshops F7.1SC3, 2007

Assessment 2 (Week 4) (8.5)

Try all questions on the assessment. At the end of the class print out your worksheet and hand it in. **Layout your worksheet neatly and clearly number each answer.**

The worksheet you hand in at the end of the class should have the following information on it at the top:

Maple Assessment 2 (8.5)

Your full name

Your department

1. Assign h as

$$\frac{2y}{(2x^2 + y - 5)}.$$

- (a) Substitute $y = 2x + 1$ into h to obtain a function only of x .
- (b) Convert the result to partial fractions.

2. (a) Determine the general solution for x and y of the pair of simultaneous equations

$$\begin{aligned} 5x - 3y &= d \\ x - y &= 1. \end{aligned}$$

- (b) Compute the solutions when $d = 3$, and when $d = 5$.

3. Assign the matrix

$$A = \begin{pmatrix} 1 & -1 & 0 \\ 0 & 2 & 1 \\ 0 & 1 & 3 \end{pmatrix}.$$

- (a) Determine A^4 .
- (b) Find A^T - the transpose of A
- (c) Find the product $A^T A$

4. Write the system of linear equations

$$\begin{aligned} x - 3y + 6z &= 2 \\ 2x - y + z &= -1 \\ 5x + z &= 0 \end{aligned}$$

in matrix form and hence find x , y and z without using `solve`.

5. (a) Define Maple functions for

$$f(x) = 2 \cosh(2x) - 1, \quad g(x) = \frac{1}{2} \ln(x)$$

- (b) Find the compositions $f(g(x))$ and $g(f(x))$
- (c) Evaluate $f(g(2))$, $g(f(2))$ to 3 significant figures