

MATH2000 final exam information

• Not examinable:

- The catenary problem (i.e. workbook section 6.3 will not be examined)
- Proof by induction (introduced on p202 of the workbook)
- Systems of differential equations (i.e. workbook section 32.5.1 will not be examined)
- Quadric surfaces (i.e. workbook section 34.4 will not be examined)
- Power method (i.e. chapter 35 will not be examined)
- Complex Matrices (i.e. chapter 36 will not be examined)

• Q1, Q2 O.D.E.s

- various methods of solving first order O.D.E.s, especially exact equations, *uniqueness & existence of solutions.*
- method of undetermined coefficients
- variation of parameters
- Hyperbolic functions. ✱

• Q3, Q4, Q5 double & triple integrals

- Double integrals in rectangular and polar coordinates, Jacobian;
- Triple integrals in rectangular, cylindrical and spherical coordinates, Jacobian;
- Determine bounds, evaluation;
- Changing the order of integration in an iterated integral;
- Applications of multiple integrals such as calculating mass, locating centre of mass, moments of inertia;
- Hyperbolic functions; ✱
- Note you are required to remember the simple formulae for the centre of mass and moments of inertia.

• Q6, Q7, Q8, Q9 vector calculus

- Flux of a vector field across a curve in 2D or surface in 3D, divergence, flux integrals, Gauss' theorem;
- Parametrisation of surfaces, surface integrals, surface area;
- Line integrals in 2D, 3D, curl, conservative vector fields, potential functions, Green's theorem, Stokes' theorem;
- Make sure you can state the theorems of Green, Gauss and Stokes, and know when and how to use them.

• Q10, Q11, Q12 linear algebra

- LU , PLU decompositions;
- Eigenvalues, eigenvectors, diagonalisation, orthogonal diagonalisation, quadratic forms, conic sections, related results;

SWOT VAC

Consultation: MON, TUE, WED 2-4.

SLC TUE 12-2.
