

SHORT CALCULUS Math 16C Sec 1 Fall 2008

Mid-term exam 1 Study Guide

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The structure of the first mid-term exam is as follows. Below is a list of the sections covered by each question together with an exhaustive list of types of questions that I might ask on the mid-term exam for each question. The list of types of questions are not given in any order.

1. Sections C.1 - C.4.

- Verify that an equation satisfies a differential equation.
- Find the general solution of a differential equation using either straight-forward integration, the separation of variables technique, or the linear first order differential equation technique.
- Find a particular solution of a differential equation given initial conditions.
- Given a verbal description of an application of differential equations
 - write down the differential equation,
 - find the general solution of the differential equation,
 - find the particular solution of the differential equation using initial conditions,
 - and answer questions about the application using the solution of the differential equation.

2. Sections 7.1 - 7.2.

- Find the midpoint of two points.
- Find the distance between two points.
- Find the equation of a sphere given sufficient information (e.g. center and radius or two endpoints of a diameter).
- Find the center and radius of a sphere from the equation of the sphere.
- Sketch the trace of a surface (i.e. the intersection of a surface with a plane).
- Sketch a plane given by an equation.
- Sketch and or identify a quadric surface from the equation of the surface (ellipsoid, elliptic paraboloid, hyperbolic paraboloid, elliptic cone, hyperboloid of one sheet, hyperboloid of two sheets).