

Math 241, Fall 2002 Worksheet 4

The final exam is scheduled for December 13 (Friday) from 9:00 am. The exam will be cumulative. The following is a list of the main formulas, concepts and techniques that you have to know and be able to use: length (magnitude) of a vector, dot product and its properties, angle formula, perpendicularity criterion, curvature, parametric formulas for curvature in 2D, distance formula, midpoint formula, cross product and its properties, area of triangle and parallelogram, volume of a parallelepiped, equation of a plane, distance between a point and a plane (formula), equation of a line in 3D, equation of a tangent line to a curve; partial derivative, second partial derivative, mixed second partial derivative, gradient vector - properties, directional derivative, tangent plane; local (global) min (max), critical points - boundary points, stationary points, singular points; Lagrange multipliers; double and triple integrals, polar, cylindrical and spherical change of coordinates, line integrals.

The following list of problems from the textbook can be helpful in your preparation for the exam. The problems in parenthesis are similar to the one immediately preceding them and are provided for additional exercise only. For instance, 9(3,5) means that you should attempt number 9 first and if you feel that you need to exercise more on this particular type of problem you could try also number 3 and 5.

- 13.1: 37(39)
- 13.3: 3,17(15)
- 13.4: 25(29,23)
- 13.5: 7(5,9),23(27,25)
- 14.1: 5,8,12,25(26),27(28),31(32)
- 14.2: 11(12),19(20),22,25,26(27),29(28),31(30),33(32),34
- 14.3: 7(8),9(10),11(12),12(14),15,17(18),24
- 14.4: 1(3),5(6),9,13(14),15,16,17(18),19,20,21(22),24(23)
- 14.5: 7(1),15(19)
- 15.2: 3(7,13),27(26),39(40)
- 15.4: 5(9),11(13),19(20),21(22)
- 15.5: 3(1),13(14)
- 15.7: 5(7),13(14),17
- 15.8: 3(1,7),19(18,17),24
- 15.9: 3(1,5),7
- 16.2: 9(3,5),15(13),21(22)
- 16.3: 11(3,5,7),15(13,17),21(19)
- 16.4: 3(1),11(13),15
- 16.7: 7(3,5),9(11),17(15),19
- 16.8: 1(3)
- 17.2: 5(1,3)