HW for amat 214:

 Section 12.1: p. 790: 7, 8, 11-13, 15-17, 30, 31, 33 - 38

 Section 12.2:  p. 799: 5, 6, 8, 9, 11, 15, 19-21, 23, 25, 27-29

Section 12.3: p. 806: 1-3, 7, 8, 15, 16, 21-24, 43, 44, 49, 50

Section 12.4: p. 814: 1-4. 13-15, 18-20, 39-41

Section 12.5: p. 825: 3-7, 23-25, 27, 29, 33-35

HINT for #5: Find 3 points P, Q, R on the plane. Find a normal vector to PQ and PR (or other similar vectors.) Since the line is perpendicular to the plane, and this normal is also perpendicular to the plane (since it’s perpendicular to PQ and PR), this normal vector is parallel to the line. A similar hint applies to #27 and #29.

HINT for #34 and #35. Find two other points on the plane and proceed as in the example in class.

Section 12.6: 1a – 1c, 2c, 3-6, 15 – 18, 24, 25, 34, 35,

NOTE: there is no need to sketch.

Just describe the surfaces (what kind of surface it is, if it’s not an ellipsoid or hyperbolic paraboloid then the direction it’s going out, and find the “tips” if it’s an elliptic paraboloid, cone, or hyperboloid of two sheets. )

Section 13.1: p. 846, #3-6, 21, 25, 26, 27, 29, 30, 40, 42 – 44.

Note: again there is no need to sketch.

Section 13.2: p. 852: 9, 11-13, 17-20, 23-25, 27, 35-38

Hint for 27: parametrize the x^2 + y^2 + 5 as usual, then in the other equation

solve for z by taking square roots. Since z =2 at the given point, you can just take the positive square root for solving for z.

Section 13.3: p. 860: 1, 2, 5, 6, 13, 14, 17-20, 21, 22, 24, 25

For 17-20, use Theorem 10 in the book to find the curvature

Section 13.4: p. 871: 5-12, 15, 16, 19, 20, 23-29, 39-42 (only find the tangential and normal components when t = 1 for these).

Section 14.1: p. 889: 13 – 19, 44-47, 65 – 68. For all the problems there is no need to graph, just describe the level curves and surfaces.

Section 14.2: p. 898 : 5-8, 14, 17, 29 – 36

Section 14.3: p. 912 : 15 – 23, 31 – 33, 41, 43, 53, 55, 63 – 65.

Section 14.4: p. 922: 1-5, 17 - 19, 21, 31, 32 (for 31, 32 just approximate the desired changes using the formula we discussed).

Section 14.5: p. 930: 1-5, 7, 9, 17 – 20, 38 - 40.

Section 14.6: p. 945: 4-13, 21-25, 41 – 44. For 41-44 you do NOT need to find the normal line (though this is easy and is just the line in the parallel to the normal vector passing through the given point.)

Hint for #42: bring everything to ONE side to get f(x, y, z) = 0, then proceed as in the notes.

Section 14.7: p. 954: 5-13, 29, 30, 33-35, 46, 48. Note: for 5-13 you do not need to graph anything.

Section 14.8: p. 963: 3-9, do p. 954 #51 using Lagrange Multipliers

Section 15.1: p. 981: 1-6

Section 15.2: p. 987: 1-16, 25, 26, 35, 36

Section 15.3: p. 995: 1-6, 13 – 20, 23 – 25. Note: for 15 – 16, “setting up integrals for both orders” means set up the double integral first by treating D as a type I region, then do the same thing treating D as a type II.

Section 15.4: p, 1002: 1-4, 7-12, 14, 19, 20

Section 15.6: p. 1, 2, 4 – 10 HINT for #5: $z=\sqrt{9- y^{2} }$ is the portion of the cylinder that lies above the xy plane, so use this surface!!

Section 15.7: p. 2-10, 12 – 15, 19, 21. NOTE: for 14 and 21, as before, you can essentially omit the word “cylinder” and just use the regions given in the xy plane.

Section 15.8: p. 1-10, 17 – 22. HINT for #20, in the given xy region, z = x + y + 5 is always ABOVE the xy plane (you can check this yourself by minimizing x + y + 5 on the given region as we did in 14.7).

Section 15.9: 1-4, 9 – 13, 19 – 26. For a challenge, try 30 and 35 (for 35 just find the volume). Note that these last two are trickier then you probably would find on an exam, though it’s certainly doable given everything we’ve discussed.

Section 16.1: 11 – 18, 21 – 24

Section 16.2: 1 – 8, 13 – 15, 19 – 21

Section 16.3: 3 – 7, 12 – 14, 19, 20