Chapter 13 recommended exercises:

* 13.1 (vector basics in 2-d): 1, 4, 5-8, 23, 30, 44, 45, 63\*, 67\*, 69\*, 73\*
* 13.2
  + (3-d basics; vectors, spheres and cylinders): 4, 19, 25, 33, 35\*, 37
  + (parametrizing lines): 43, 51, 53, 57, 60\*, 61\*, 76\*
* 13.3 (dot products and angles): 51, 67-72, 83\*, 84\*, 87, 91, 97\*
* 13.4 (cross products): 26 (you do have to check that **v** x **w** is not dependent on the choice of vectors if they meet the given criteria, just checking one possible pair of **v** and **w** is not enough!), 43, 58, 66\*, 73, 75, 79, 82\*, 83
* 13.5 (planes): 17, 31, 39, 41\*, 45, 51, 59, 65, 66, 73\*, 74\*
* 13.6 (quadric surfaces): 17-20, 27, 29\*, 32\*, 50\*, 53\*
* 13.7 (cylindrical and spherical coordinates): 11, 16, 17, 27-29, 38, 49, 54, 56, 78\*

Chapter 14 recommended exercises:

* 14.1 (vector valued functions): 8, 9, 14\*, 15\*, 27, 28, 29, 31, 36, 37, 38, 50
* 14.2 (calculus of vector-valued functions): 7-10, 19-21, 25, 32, 46, 65\*, 67, 72
* 14.3 (arc length and speed): 1-4, 11\*, 23-24, 39\*, 41\*.

Chapter 15 recommended exercises:

* 15.1 (Functions of several variables): 1-4, 8,9, 17, 21-22, 34-38, 40, 60, 61
* 15.3 (Partial derivatives): 2, 3, 7, 10\*, 11-14, 75-78, 80\*.
* 15.4 (Differentiability): 6-11, 16-19, 24, 37\*, 42\*
  + If you're interested in why we talk about continuity of the partial derivatives, look at problem 47, but this uses material from 15.2 which we did not cover.
* 15.5 (Gradient and directional derivatives): 1, 3, 4, 17-20, 22, 29, 30, 33, 37\*, 40, 43\*, 48, 50, 56\*, 57\*, 59, 65\*, 75-76.
  + If you're interested in differentiability in going deeper, look at 70 and 72, but like 47 from the previous chapter, this is beyond the scope of this course.
* 15.6 (Chain rule): 1-2, 19, 20, 23, 25, 26\*, 36\*, 41, 44, 45, 54
* 15.7 (Optimization): 2\*, 3\*, 4, 13, 19, 20, 24, 25\*, 29-32, 39, 50\*, 51, 60\*, 61\*, 63\*
* 15.8 (Lagrange multipliers): 2, 8, 10, 13, 17\*, 19, 22\*, 31, 39, 40\*, 49, 53, 54.

Chapter 16:

* 16.1 Double integrals: 6, 11, 22, 29, 48, 51, 52\*, 55\*.
* 16.2 More general double integrals: 8, 12, 13, 17, 29\*, 30, 33, 36\*, 39\*, 44, 54\*, 55\*, 60, 65, 66, 70
* 16.3 Triple integrals: 6, 11, 12, 15\*, 16, 24\*, 25\*, 26, 31\*, 39, 40,
  + 46 is interesting too, I would recommend for fun but we won't be doing higher dimensional integrals in this class.
* 16.4 Polar, cylindrical, spherical coordinate integrals: 15, 17, 21\*, 22\*, 23\*, 24, 33, 36, 37, 39\*, 40, 46, 49, 57\*, 60\*
* 16.5 Applications of multiple integrals: 6, 18, 19, 21, 23, 35\*, 36\*, 51\*, 62, 63

Chapter 17:

* 17.1 Vector Fields: 1, 9, 11, 12, 13-16, 23, 29, 33, 38, 52\*, 53\*, 56\*, 57
* 17.2 Line integrals: 1\*, 2\*, 20, 27, 30, 37, 39, 43\*, 45\*, 54, 57, 62\*, 63\*, 70\*, 71,
* 17.3 Conservative vector fields: 1, 2, 6, 7, 14, 18, 23\*, 24\*, 33, 34\*
* 17.4 Parametrized Surfaces and Surface Integrals: 1\*, 2\*, 13, 14, 28\*, 29, 40\*, 41, 45\*
* 17.5 Surface integrals of vector fields: 2, 3, 12, 13\*, 18\*, 20\*, 36, 37\* (don't worry about the CAS part if you don't have access to that software to draw the picture. Even if you do, try to look at the equation and see how it can represent a Mobius strip - fix one of u or v and see what kinds of curves are drawn), 38

Chapter 18:

* 18.1 Green's Theorem: 2\*, 3, 7, 10, 14\*, 15, 16\*, 20, 23\*, 24, 25\*, 28, 31\*, 46
* 18.2 Stoke's Theorem: 1, 5, 6, 11\*, 13\*, 18\*, 20\*, 26, 27, 31\*, 38
* 18.3 Divergence Theorem:
  + Exercises: 1, 2, 9\*, 12, 18\*, 19\*, 20, 36, 37\*, 38, 39