Math 2204: Written HW 3 (Due Wednesday 2/12, 5pm)

No calculator or other electronic devices for written HWs.

Hand in all work and reasoning for the following problems

- **Section 12.6**: 11, 28 (**Give a reason**), 45, 46.
- **Section 14.1**: 4c, 7, 9, 25 (first octant only), 30, 45.

A) Sketch the following surfaces using the procedure outlined in the posted 12.6 slides, i.e.
(i)Determine for which traces you have points, no solution, and elliptical traces.
(ii)If a surface has no elliptical traces, use parabolic traces.
(iii)Discuss straight/curved, give the size of one ellipse, label axes, and name each surface.
Very limited credit if you don't follow the procedure from the 12.6 slides.

1. **Section 12.6**: 16.
2. **Section 12.6**: 22.
3. **Section 12.6**: 40.
4. $x + 4y^2 + z^2 = 4$.
5. $x^2 + y^2/4 = z^2$.
6. $x^2 - y^2 + 2y + 4z^2 = 2$.

Show reasoning for domain/range problems below. Just an answer will get no credit.

B) Let $f(x, y, z) = \ln(x^2 + 4y^2 + z^2 - 4)$.

1. **Find and sketch** the domain of f.
2. Find the range of f.

C) Let $f(x, y) = -\sqrt{4 - x^2 - 4y^2}$.

1. **Find and sketch** the domain of f.
2. Find the range of f.
3. Sketch the graph of f.
4. Sketch a contour map (level curves) of f.
   Determine for which values a level curve exists and include all different types of curves that exist. Your contour map should show a good representation of the function.
   Label level curves, give the name of each curve, and include relevant positions.