**Problem Set Solution Week 12 and 13**

1. The answer must have the following features
   a. Surface is parallel to y, intersection of this surface with the xz-plane forms a circle at the origin with radius 5.
   b. The question contains all 3 variables so none of the variables can vary arbitrarily.
   c. The variable z can take on any value without limit, therefore the line composing this surface are parallel to the z-axis. The intersection of this surface with the yz-plane outlines curve $y = sin\, x$

2. Sketch the intersection of the surface with a plane parallel to one of the coordinates planes (known as trace)
3. Find the trace as xy-plane and set z=0, also to find other trace then set x=0 and y=0. Then combine all shapes
4. Set z=0 and let z to be the arbitrary plane then z=5 (ellipse)
5. The following
   a. Ellipsoid, centered at origin
   b. Elliptic paraboloid centered at (1,-2,0)
6. Should show a parabolic cylinder
7. Should show an ellipse
8. Should show an elliptic paraboloid
9. Should show a hyperbola
10. Should show a hyperboloid of one sheet