MATH 223

Some Notes on Assignment 8

Write out careful and complete solutions of Exercises 1, 3, 5, 7, and 8 below.

34. Show that one parametrization of the plane $x+3y+5z=7$ is $x=s, z=t, y=\frac{7}{3}-\frac{s}{3}-5\frac{t}{3}$
Solution: since $3y=7-x-5z$ implies $y=\frac{7}{3}-\frac{x}{3}-5\frac{z}{3}$. $x+3y+5z=s+3(\frac{7}{3}-\frac{s}{3}-5\frac{t}{3})+5t=s+7-s-5t+5t=7$.

36. Find a parametrization for the plane $x+3y+5z=7$ where $y=s, z=t$.
Solution: Since $x=7-3y-5z$, we can use the parametrization
$x=7-3s-5t, y=s, z=t$.

38. Show that $x=6\cos s, y=6\sin s, z=t$ for $0\leq s\leq 2\pi, -1\leq t\leq 7$ is a parametrization of the cylinder $x^2+y^2=36, -1\leq z\leq 7$.
Solution: $x^2+y^2=36\cos^2 s+36\sin^2=36(\cos^2 s+\sin^2 s)=36$.

39. Show that $x=4\sin s\cos t, y=4\sin s\sin t, z=4\cos s$ is a parametrization of the sphere of radius 4 centered at the origin.
Solution: $x^2+y^2+z^2=16\sin^2 s\cos^2 t+16\sin^2 s\sin^2 t+16\cos^2 s$
$=16\sin^2 s(\cos^2 t+\sin^2 t)+16\cos^2 s=16\sin^2 s+16\cos^2 s=16$.

40. Find a parametrization of the cylinder $x^2+z^2=100$.
Solution: $x=10\cos s, y=t, z=10\sin s$

41. Find a parametrization of the cylinder $y^2+z^2=100$.
Solution: $x=s, y=10\cos t, z=10\sin t$