Math 53 Discussion

Quiz on Monday: Topics to review:

1. Section 12.4: cross product, finding the area of a parallelogram, finding the volume of a parallelepiped
2. Section 12.5: equations for lines and planes, finding the equation for a plane given 3 points or given a point and a line, finding the vertical distance between a point and a plane
3. Section 13.1: Sketching space curves

Practice Problems: equations for lines, intersections of lines, space curves, derivatives

1) Find parametric equations for the line through the point $(0, 1, 2)$ that is parallel to the plane $x + y + z = 2$ and perpendicular to the line $x = 1 + t, y = 1 - t, z = 2t$.

2) Consider two lines L_1 and L_2 in the plane given parametrically by

$$x = 2 - t, y = 1 + t$$

$$x = 2 + t, y = 4 + 2t$$

Do these lines intersect? If so, where?

Over for questions 3) and 4) →

3) If you have the textbook - Questions 21 and 25 from Section 13.1. The questions ask to match $x = t\cos t, y = t, z = t\sin t$ and $x = \cos 8t, y = \sin 8t, z = e^{0.8t}$, $t \geq 0$, to the pictures of their curves.

3') If you don't have the textbook - Show that the curve with parametric equations $x = t\cos t, y = t\sin t, z = t$ lies on the cone $z^2 = x^2 + y^2$ and use this fact to help sketch the curve.

4) If $\overrightarrow{u}(t) = \langle \sin t, \cos t, t \rangle$ and $\overrightarrow{v}(t) = \langle t, \cos, t, \sin t \rangle$, find $\frac{d(\overrightarrow{u} \cdot \overrightarrow{v})}{dt}$.