The next section is long and difficult. Moreover, Thomas' notation is counterintuitive (for me at least). I wish to write up some notes regarding how I think about this (in the notation we have used in Linear Algebra), but that will take some time.

Please begin by reading Section 16.2, through the subsection on Gradient Fields; stop at Work if you like. This is pages 1149 through 1152.

Again, I suggest that you make notes on the material, rewriting some of it in alternate notation. For example, where Thomas write

$$\vec{F}(x, y, z) = M(x, y, z)\vec{i} + N(x, y, z)\vec{j} + P(x, y, z)\vec{k},$$

I would prefer to write

$$\vec{F} : \mathbb{R}^3 \to \mathbb{R}^3 \text{ is given as } \vec{F} = \langle F_1, F_2, F_3 \rangle \text{ where } F_i : \mathbb{R}^3 \to \mathbb{R}.$$

This is more easily generalized to higher dimensions.

Do exercises §8.2 # 1 - 6

Ask yourself how well you understand this material, and respond on the correct Google form.
Good luck, stay well, and wash your hands ten times a day.