Parametrized Curves   **John Waczak**

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1A

b. Questions

Overall, this section was very much a review of prior knowledge from calculus and linear algebra.
There were a couple of sections I had to read closely and reread a few times, in particular:

1. *Proposition and Definition 1.13* It took me a while to realize what was meant by writing
   $\mathbf{x} = \mathbf{x}^{\parallel} + \mathbf{x}^{\perp}$. Clearly the parallel component is the projection but for some reason when
   discussing vectors in $\mathbb{R}^n$ I was expecting to see n components even though this was simply
   suggesting that any vector $\mathbf{x}$ can be decomposed into a sum of parallel and perpendicular
   vectors with reference to as second vector $\mathbf{y}$.

2. *Lemma 1.12 Schwarz Inequality* I was expecting to see the more familiar expression $|\langle u, v \rangle|^2 \leq$
   $\langle u, u \rangle \cdot \langle v, v \rangle$. I think I would have been less bothered had the book's definition used the double
   bar $||\mathbf{x}||$ to mean norm because it's weird to think of the norm of an inner product which
   returns a scalar (although I guess the norm of a scalar α is simply $\sqrt{\alpha^2}$ which is a definition
   for absolute value...)

3. *Example 1.9 Shortest path between two points* It took me a few rereads to think about why
   it is sufficient to show $L \geq d$ where d is the straight line distance and not $L > d$.

4. *Inner product* Something I always find interesting is using the inner product to define *angle*
   in higher dimensional space.

c. Reflections

I first read closely through the section in order to familiarize myself with the material. As I read I
circled things I had questions about with pencil. I took note of the examples but didn't work them
out in detail and paid close attention to the included proofs. Afterwards I went back through with
a highlighter and marked parts I thought were important that weren't already bolded or boxed in
the text.

d. Time

It took me approximately an hour and a half to read through the section thoroughly and another
half hour to go back and highlight what I thought to be important / interesting information.