DIFFERENTIAL GEOMETRY WEBSITE PLAN

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GUIDELINES

- Straightforward and concise.
- Modular so that people can use just that page if needed.
- Motivate each topic well.
- However, keep motivation brief and possibly visual.
- Incorporate
- Hide boring computations so that when glancing over, the overall logic is obvious.
- Simple and minimal design.
- Backbone is always interactive visuals... generally first work on level (1) explanations, build interactive visuals for that, then build higher levels ontop. For rigorous level might sometimes use visuals after learning the topic.

DIFFERENT OPTIONS

(1) Intuitive level with visuals. This could often act as the motivation for the topic.
(2) Basic, undergrad-ish level
(3) Formal level.

RIEMANNIAN GEOMETRY OUTLINE

- Background
  - Necessary multivariable calculus
  - Explanations for lengths, areas, angles, etc. in curvilinear coorinates. Then I can just use formulas without explanation in motivation?
- Definition of Riemannian manifold.
  - (1) Motivation is visual with sphere... want to calculate lengths on the sphere, so bestow the map of a globe with geometric information (line element?). Keep brief. Doesn't need to be precise?
  - (1.5) Maybe also give inner product g visual on sphere.
  - (2) Practical informal "definition". Surface and coordinates with line element like Iva does.
  - (3) Elementary formal definition using coordinate charts.
  - (4) Formal definition with smooth manifold theory as in Lee (requires extra background).
- The sphere as Riemannian manifold.
  - (1-2) Manipulations with line element.
  - (2-3) Computations with inner product.
  - (3)
- Using Riemannian metric to compute lengths, angles, distances, volumes.
- Geodesic equation (for 1-2 certainly). (3) might take different path, not sure.
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THOUGHTS