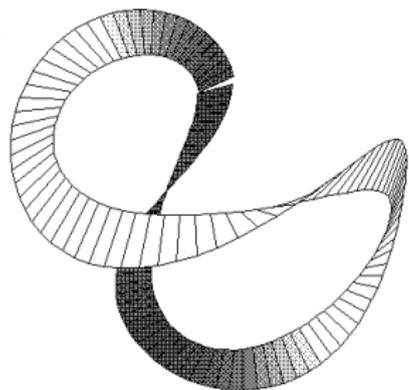


1. For the phone cord curve, which of the following are true?



- a) $\kappa = 1$ is constant but $\tau = \sin(s)$ varies
- b) $\tau = 1$ is constant but $\kappa = \sin(s)$ varies
- c) They are both constant
- d) They both vary
- e) Rudy Rucker said there is no way to know

2. For the rocker curve, which of the following are true?

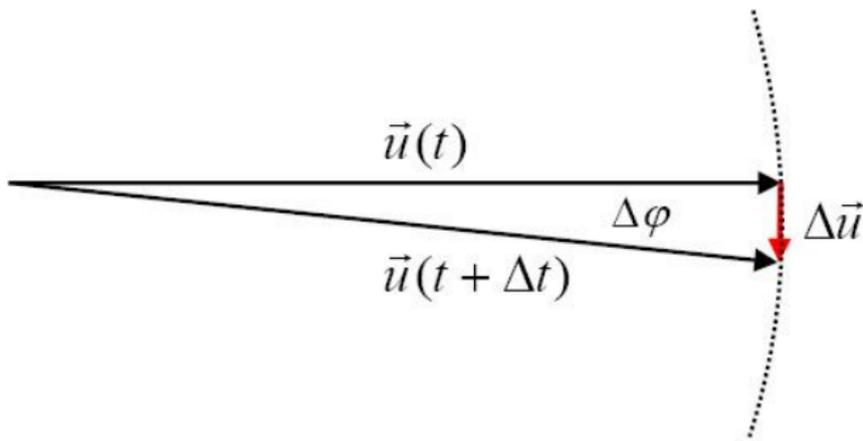


- a) $\kappa = 1$ is constant but $\tau = \sin(s)$ varies
- b) $\tau = 1$ is constant but $\kappa = \sin(s)$ varies
- c) This is a baseball stitch curve
- d) More than one of the above
- e) None of the above

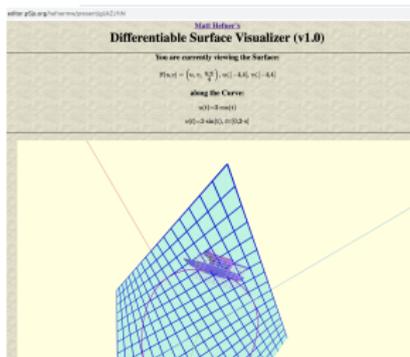
<https://demonstrations.wolfram.com/Intrinsic3DCurves/>

3. To prove that the derivative of a unit vector \vec{u} is perpendicular to the original, we...

- a) took the derivative of $\vec{u} \cdot \vec{u}$ and argued from there
- b) took the derivative of $\vec{u} \times \vec{u}$ and argued from there
- c) both of the above
- d) none of the above



Frenet-Serret TNB Frame Review



Matt Hefner <http://matthefner.com/geometryofcurves.html>

- How did we show $N \perp T$?
- Why is B perpendicular to both T and N ? Hint: consider how we defined B .

Frenet-Serret TNB Frame Review



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- How did we show $N \perp T$?
- Why is B perpendicular to both T and N ? Hint: consider how we defined B .
- Review: For the TNB derivatives, we defined $T'(s) = \kappa N$. Next, we showed B' had no B component and no T component and thus it makes sense to define $B' = -\tau N$. Then we explored the components of N' .
- Curves matching activity

spherical epitrochoid

- circle rolling on another circle
- J. M. ain't a mathematician

`https:`

`//math.stackexchange.com/questions/15260/
famous-space-curves-in-geometry-history`

- `https://drive.google.com/file/d/1ur_
M4iyGetKYAdcfMvIYPdimU7LJa8s0/view?usp=
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sharing`

kinematics of gear systems

- Johann Bernoulli (1742). "Opera Omnia, Lausanne and Generva, t. III." *Lect. Hospitalii* XXII: 454

Franz Reuleaux (1876). *The Kinematics of Machinery*