- Think about a possible answer(s), discuss your thoughts with your neighbors, and respond on `pollev.com/drsarah314`

  Which of the following is $\alpha'(s)$ where s is the arc length parameter?

  a) velocity
  b) unit tangent vector T
  c) curvature
  d) more than one answer works
  e) none of the above

- Prepare to share from your group's discussion. This may take the form of an assertion, question, definition, example, or other connection. It could also be something you tried and rejected.
- May be a lag at times—review related concepts and examples, add to your notes, or get to know each other!

How did chain rule arise in the arc length s, T, velocity, speed, acceleration and jerk interactive video?

a) In the prior video on the tractrix, it was a part of the computation of the arc length of the tractrix as it was needed for the velocity and hence speed, and we used that again in this video
b) It arose in the proof that every differentiable curve that is regular can be reparameterized by arc length
c) When we are computing $T(t)$ instead of $T(s)$, it's chain rule at work!
d) all of the above
e) exactly two of the above

Arc Length s and Unit Tangent T of Helix

Work with neighbors or check-in with them regularly:

$\alpha(t) = (a\cos(t), a\sin(t), bt)$ where $a, b \in \mathbb{R}$ constants

- Compute unit tangent $T(t) = \frac{\alpha'(t)}{|\alpha'(t)|}$
- Compute arc length $s(t) = \int_0^t |\alpha'(u)| du$
- Write the inverse function $t(s)$ by solving for t
- Reparameterize the curve by arc length $\beta(s) = \alpha(t(s))$

http://previews.123rf.com/images/limbi007/limbi0071302/limbi007130200034/17726502-Orange-cartoon-characters-runs-on-the-green-helix--Stock-Photo-orange-spiral.

Differential Geometry of Helix in Maple

- velocity, acceleration, jerk
- speed and arc length
- T in Frenet-Serret TNB Frame, curvature and torsion

http://previews.123rf.com/images/limbi007/limbi0071302/limbi007130200034/

17726502-Orange-cartoon-characters-runs-on-the-green-helix--Stock-Photo-orange-spiral.

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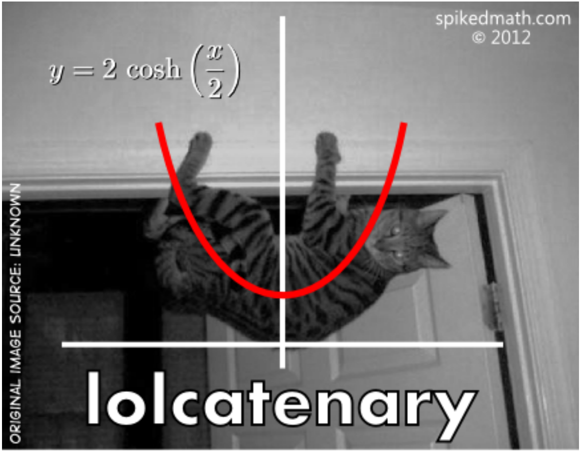

In physics and geometry, the lolcatenary is the curve that an idealized hanging lolcat assumes under its own weight when supported only at its ends.