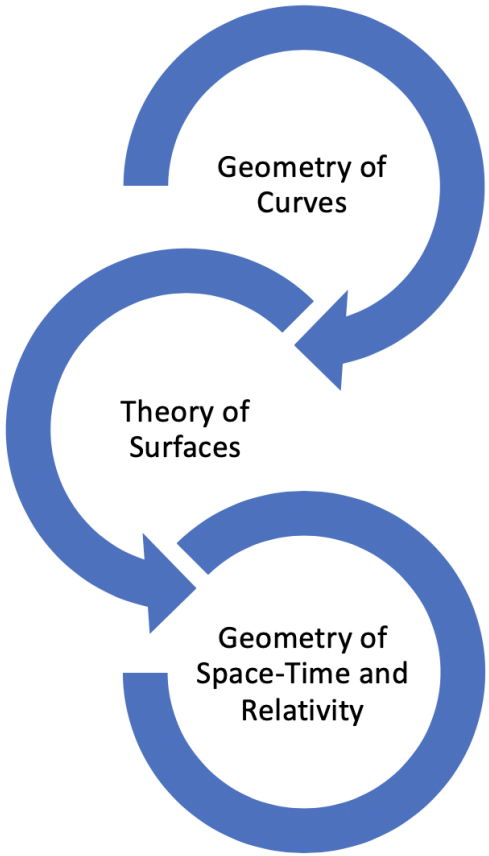
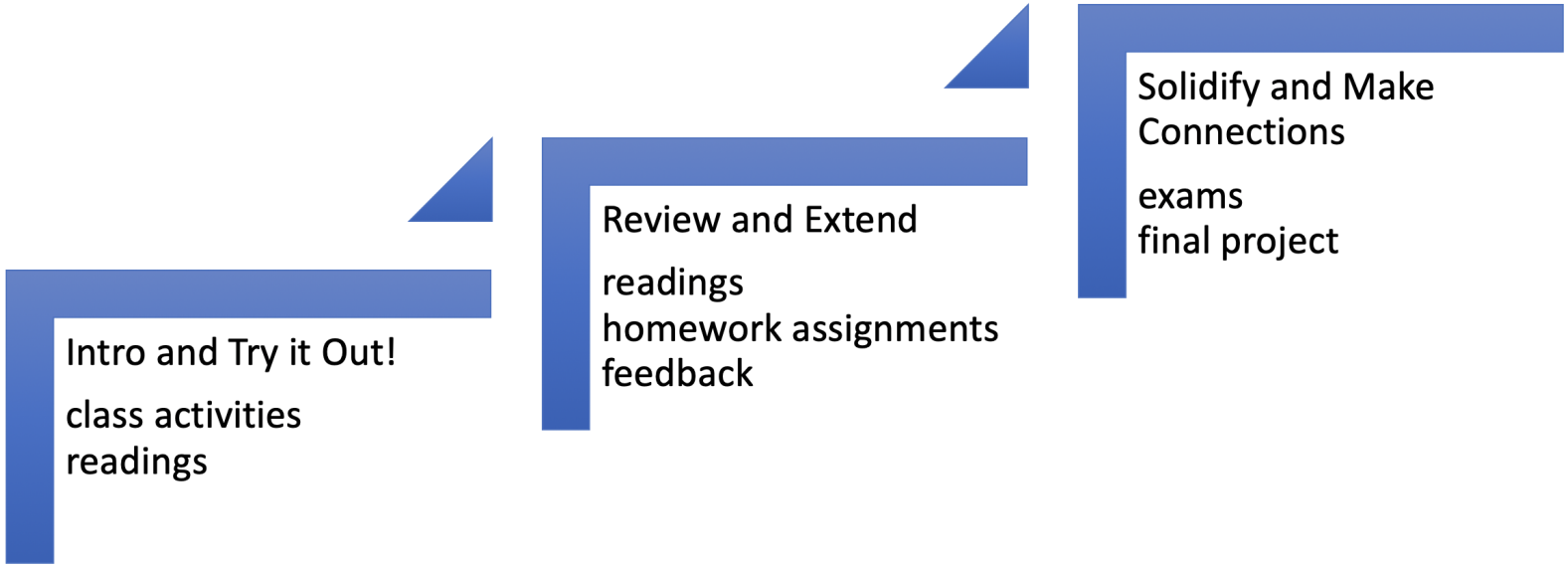
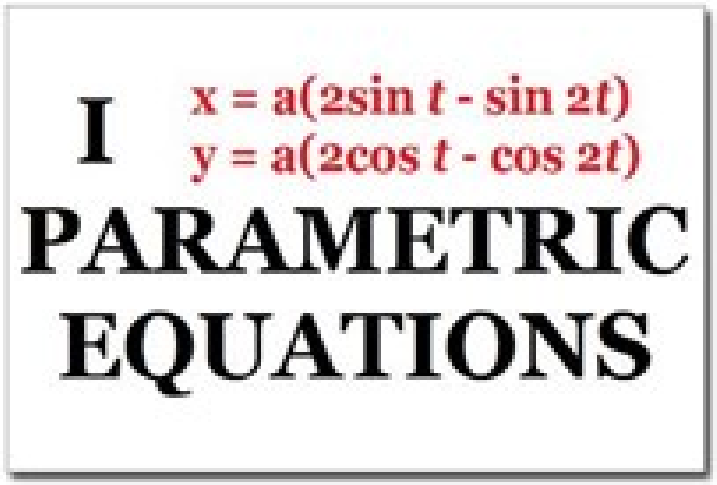
Differential Geometry



theoretical and computational components
intrinsic and extrinsic viewpoints
numerous applications
4140 prereq of 2130, coreq of 2240 [review of material]



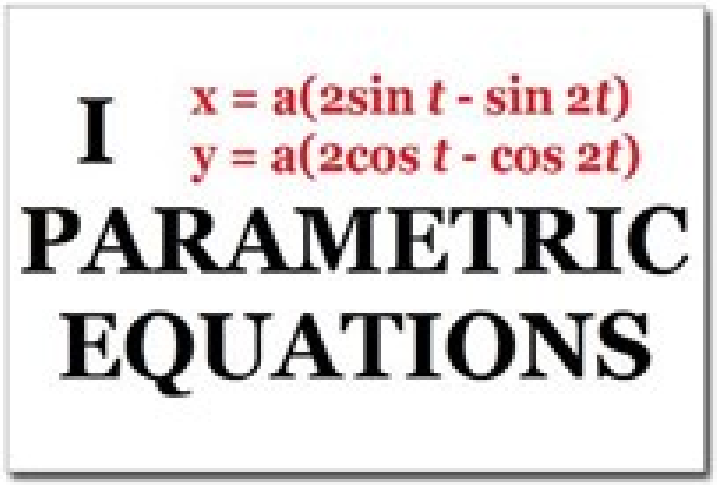
- Effective Class Engagement 7.5%
  attendance is required
- Effective ASULearn Engagement 7.5%
- 7 Homeworks 30%.
  No late work, but lowest hw is dropped
- 2 Exams 40%
  No late work, but can revise lowest exam
- Final Research Presentation 15%
- Work due start of class (can send it with another student), under my office door sometime before I leave for class, or even turn in on ASULearn if need be, but I prefer printed



https://www.cafepress.com/+parametric_equations_postcards_package_of_8,790199315

with(Student[VectorCalculus]):

```
TNBFrame(<2*sin(t)-sin(2*t),2*cos(t)-cos(2*t),0>,
range=0..3*Pi,output=animation,
scaling=constrained,axes=frame,frames=50);
```



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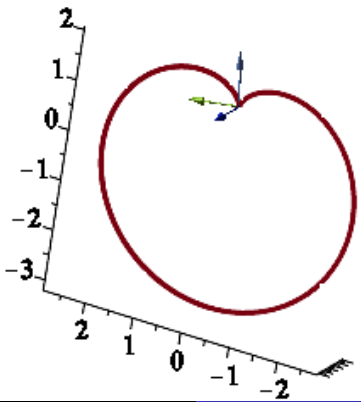

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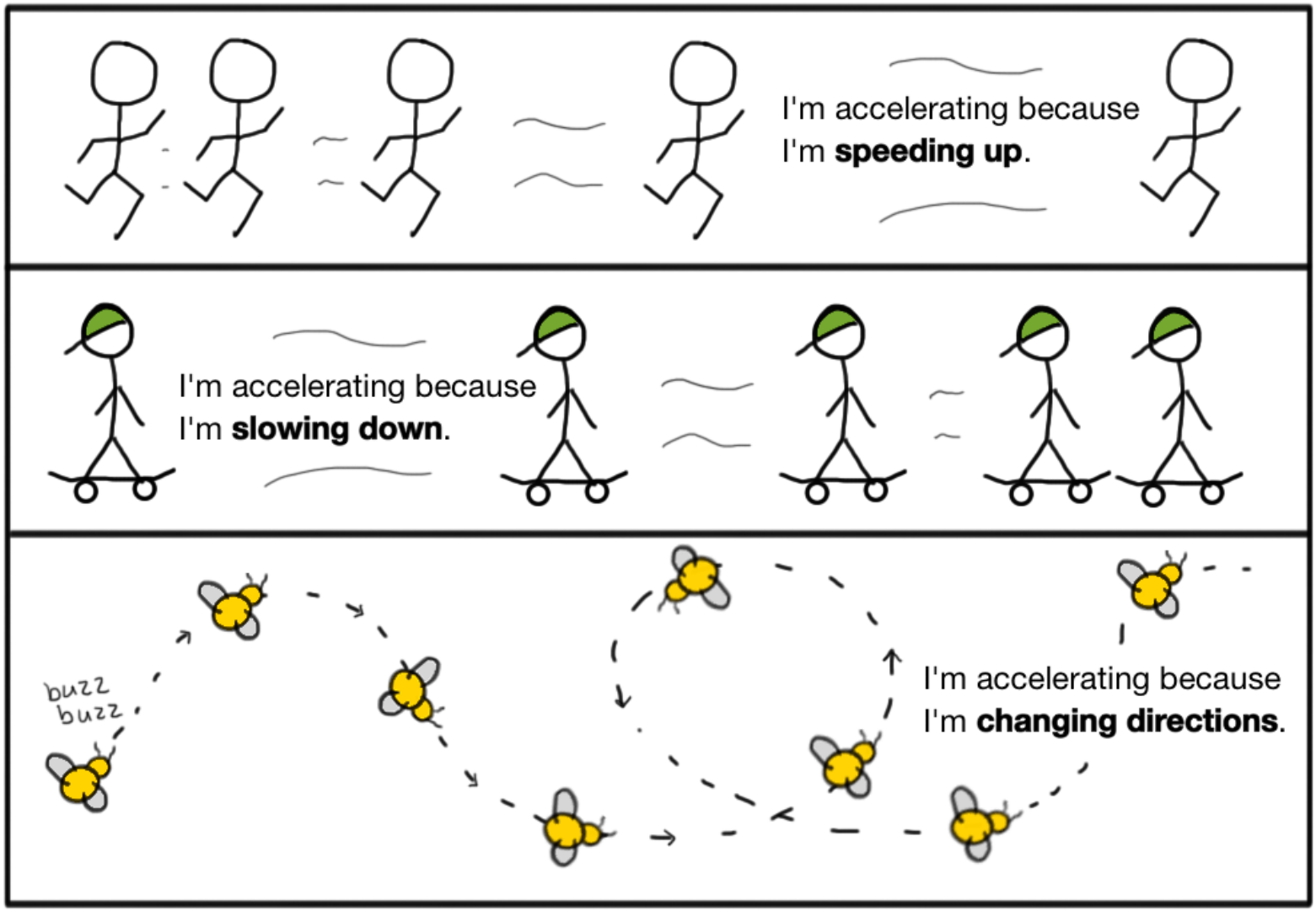
Compare and contrast these curves:

- $\alpha(t) = (cos(t), sin(t), t), t \in (0, 2\pi)$
- $\alpha(t) = (cos(2t), sin(2t), 2t), t \in (0, \pi)$
- $\alpha(t) = (cos(t), -sin(t), -t), t \in (-2\pi, 0)$

Prove that $\alpha(t)$ is a curve that is a constant speed straight line iff the acceleration is $\vec{0}$.



https://www.khanacademy.org/science/physics/one-dimensional-motion/acceleration-tutorial/a/acceleration-article

Why is a line the shortest distance path between 2 points?

Intuition?

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Prove that a line $l(t)$ is shorter than any other curve $\alpha(t)$ between $\vec{p}$ and $\vec{q}$.

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After you have had a chance to review Calculus with Analytic Geometry III, you'll come back to this in the homework readings.

Where to Get Help

- Class
- Office hours before and after class
- Google *Dr. Sarah* for course calendar
- ASULearn *need help from me* private forum

I care about you and your success!