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#StudentsTeachingStudents
bit.ly/STSNCTM
Topics to select:
· Completing the square (geometric interpretation as well as algebraic)
· Solving radical equations (all types, including extraneous solutions)
· Graphing piecewise functions
· Finding the domain and zeros of a function given its equation
· Solving the max/min/zeros of a quadratic word problem
· Evaluating a difference quotient
· Finding combinations of functions and their domains
· Finding intervals increasing and decreasing, maximums, and minimums of a function
· Determining whether a function is even, odd, or neither given a graph or an equation and also symmetries
· The horizontal line test and restricting inverses of functions that fail the HLT
· Finding the vertex and x-intercepts of a parabola multiple ways
· Long division of polynomials; remainder and factor theorems
· Using the rational zero theorem to factor polynomials
· Solving problems using inverse, direct, and joint variation
· Sketching rational functions by finding vertical & horizontal asymptotes, zeros, and test points (part 1)
· Sketching rational functions by finding holes and slant asymptotes (part 2)
· Finding the directrix, focus, and vertex of a parabola
· Finding the equation of a parabola given certain features
· Graphing an ellipse by completing the square and putting it in standard form
· Finding the equation of an ellipse given certain features
· Finding the equation of a hyperbola given certain features
· Developing and using the compound interest formulas
What makes a good student taught lesson??

There are several things that make a good student-taught lesson:

- Notice your lesson first. Think about the beginning, middle, and end (laws and things humorous but pertinent) as well as the whole process of the end.
- Start by stating the objective of the lesson. What are you trying to teach? This may be verbal but it should also be written out or annotated.
- Next, begin with a 'hook' (something that frames the problem and gives it some background information that the viewer may already know or will make them want to care about it).
- Define the problem or your task, and your answer. Do you feel confident enough explaining it? Can you solve the problem and check the answer in more than one way? Do you feel comfortable explaining the process in more than one way? One or handout for teaching is knowing how to adjust the audience if they take a misconception.
- Before you make your video: Make sure there are no errors. If it is a real pain to re-do a video after errors are found, ask the class before you.

- Be creative in your presentation. Just lecturing the problem is not going to be interesting for the viewer. What can you do to make your presentation stand out?
  - Practice, practice, practice. Use the mirror or a peer or parent/guardian for practice.
  - Decide what video creation tool you will be using and make sure you are proficient with it.
  - Change the level of your voice. Keeping it monotonous will not grab the viewer’s attention.
  - Check the lighting if using Movie and remove anything that could be distracting for the viewer. Before you film the ENTIRE video, check your lighting, is it useful if you ask someone else to look, too, for an extra eye.
  - Make transitions smooth with no pauses in between.
  - Make sure that your words are BRIGHT and full of life.
  - Make your visuals colorful. If using Explain Everything, decide what you want to be written on your video before you begin. Make sure your writing is large enough and clear.
  - Have some sort of an ending. Can you recap what you said? Add a funny anecdote?
  - How is your pacing throughout? Are you going too fast? Too slow? Use the "Godfather" rule and try to start "at the end". Do you think you are able to keep the viewer’s attention through your?

- Be sure to follow copyright laws and credit all authors.
  - Fair use of the YouTube video. The video must be creative commons licensed by Creative Commons. Check YouTube for a great resource for finding videos.

- Title: Keep your lesson to under 15 minutes (credits may have an additional 20 seconds (3:15 minutes is a good amount... you don’t want to go to 9 unless you have to).

- Read examples: Click here for Ken Snyder’s lesson or here for Brian’s lesson or here for Alex Joth’s lesson or here for Damien Garcia’s lesson, or here for Brian’s lesson, all of which make excellent use of Stop Motion and timing. There is an excellent lesson by Damien Garcia, which he used for Eastern Everything (keep in mind that Damien makes this before the "hook" and "loop" was a requirement). Also check out: Andrew’s Comic or Hamsterdam for great ones that DON’T involve Stop Motion. Look here for some videos from NeedCoder, not necessarily mathematical, created by Rachel Hoca.

- If you are reading into animation, check out this video (animated film ever nominated for an Oscar) by Pixar’s Freshwater, and you can Google a TON of them, here is a TedEd lesson on both animation basics and the art of timing and spacing. You can use clay, paper, and other objects from around the house.
THANK YOU!

Want to start a TED-Ed club? Use: bit.ly/TEDEDCLUBS (all caps)

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For a folder with info from today’s session!