

**Challenging Precalculus
Alternative Assessments
Using the Free Online
Desmos Calculator**

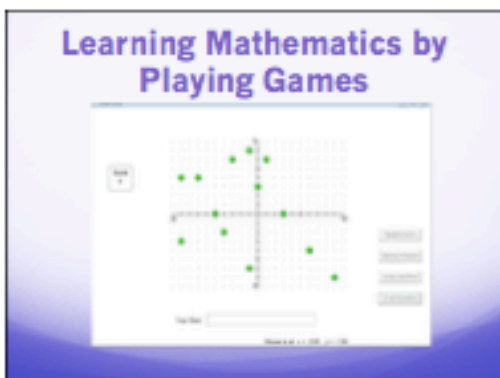
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Philadelphia, Pennsylvania
November 2, 2016

**Innovation in Technology
for Mathematics Education**

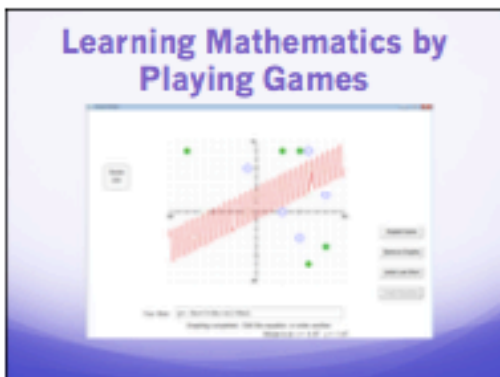


**Exploring Mathematics
Software for Education**

- Geometric Supposer
- Green Globs & Graphing Equations
- Mathematics Exploration Toolkit
- Discovery Learning in Trigonometry







Follow That Curve

- Follow That Curve
- $y = x$
- $y = x + \sin(x)$
- $y = x + 3\sin(x)$
- $y = x + \sin(10x)$
- $y = x^2$
- $y = ((x + \sin(x))^2)$
- $y = ((x + \sin(4x))^2)$
- $y = 0.1x^2$
- $y = 0.1((x + \sin(4x))^2)$

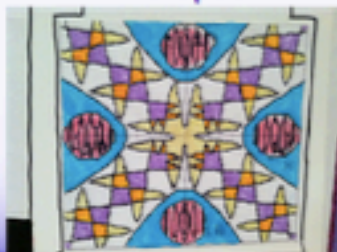
Creating Mathematical Envelopes



Creating Mathematical Envelopes



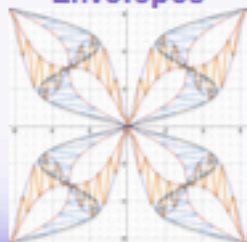
Creating Mathematical Envelopes



Graphing Borders of Envelopes

- Borders
 - $y^2 = (\sin(x) + x)^2$
 - $y^2 = (3\sin(x) + x)^2$
- Fill
 - $y^2 = ((\cos(10x) + 2)\sin(x) + x)^2$
- Repeat with Inverses
 - $x^2 = (\sin(y) + y)^2$
 - $x^2 = (3\sin(y) + y)^2$
 - $x^2 = ((\cos(10y) + 2)\sin(y) + y)^2$

Creating Mathematical Envelopes



Trig Graphs and Their Polar Counterparts



Trig Graphs and Their Polar Counterparts

Part 1

- $f(x) = 2\sin(x)$
- $f(x) = \cos(2x)$
- $f(x) = 2\sin(x) + \cos(2x)$
- $f(\theta) = 2\sin(\theta) + \cos(2\theta)$



Trig Graphs and Their Polar Counterparts

Part 2

- $f(x) = \sin(4x)^2$
- $f(x) = \cos(3x)$
- $f(x) = \cos(3x) + \sin(4x)^2$
- $f(\theta) = \cos(3\theta) + \sin(4\theta)^2$