Mathematics Association of Two-Year Colleges of New Jersey

Arc Functions
Through Auditory, Symbolic, Visual, and Kinesthetic Modalities

Abstract

The fact that you are reading this text is evidence that you are probalby very proficient in the traditional modalities: auditory and symbolic, perhaps even the visual. Now enrich/extend your options. Consider arc functions in all the modalities of the 21st century: auditory, symbolic, visual, and kinesthetic. All material is free and downloadable.

The Languages of the Math Classroom

MOTHER TONGUE & OTHER TONGUE(S)
⟵ Most Sophisticated and also the Most Basic ⟶

MOSTLY MATH TONGUES
⟵ Most Sophisticated, Most Basic ⟶

VERBAL / Auditory	WRITTEN / Symbolic	PICTORIAL / Visual	CONCRETE / Kinesthetic
formal spoken mathematics	written word	DIGITAL MANIPULATIVE	object
informal spoken mathematics	written symbol	moving picture	model
spoken symbol	semisymbolic	static picture	DIGITAL MANIPULATIVE
symbol speak	calculator symbol	numeral	
calculatoreze/computereze		graph	
web speak		nonverbal body language	

Suggestions

- Choose a modality first.
  VERBAL / Auditory WRITTEN / Symbolic
  PICTORIAL / Visual CONCRETE / Kinesthetic

- Usually, introduce in the most concrete.
- Summarize in the most abstract.
- The Mother Tongue is both the most concrete & the most abstract.
- Sometimes use multiple modalities at the same time.
- Strive for comfort in all modalities, not just your favorite.
- Repeatition improves retention, especially in different modalities.
- Need a review before new material?
  Don't review with a COMPUTATION OF SYMBOLS,
  review with a PICTURE OF THE COMPUTATION.

Arithmetic Stuff:

- Inverse **Math Spoken Here!** dictionary definition
- arc **Math Spoken Here!** dictionary definition

Precalc Stuff:

inverse web page -- Find the Inverse of a Function in 4 Modalities
- **inverse.gsp**, described & linked below
- 3 Problems & Answers set up to first take an inverse graphically then room for algebraically
- Notes on Inverse Functions including taking in inerse function verbally
- Arc and arc functions in the trig topics

Calc Stuff:

- m131Dinverse.pdf Warm-Up on Notes on Taking the derivative of an Inverse function, and answers
- Inverse Functions & Their Derivatives & Antiderivatives
- **absement.gsp**, described & linked below
  -- absity, absement, displacement,velocity, acceleration, jolt, jounce, ...
  -- derivatives & antiderivatives of displacement

MATYCNJ23.pdf - of this page

Dowload **inverse.gsp - Sketchpad of inverse functions**

0 - vertical, horizontal line tests
1 - square root fx
2 - any function
3 - sqrt fx by parameters
4 - restricted domain on inverse
5 - arcsine
6 - arctangent
7 - f and inverse
8 - f, inverse, tangents

Dowload absement.gsp

0 - toc
1 - time, t
2 - displacement, distance, s(t)
3 - definition of derivative
4 - s(t), s'(t)
5 - s(t), s'(t), s''(t)
6 - emojis, f, f', f'', tangent line
7 - trace derivatives
8 - PARTITION & SUMS 4 boxes
9 - Reimann & Sums
10 - SUMS absement, input [a,b]
11 - absement, n=32
12 - absement plus c
13 - play absement plus c
14 -arcsine actual fx graphed
15 - arcsine mesh - useF(x) plot to plot arcsine

Languages of the Math Classroom
Free Geometer's Sketchpad!