

Category

Means of Support

Landmark

Covariation

Functional
Chunky

Lab 2

Smooth Covar.
(Power of cup metaphor)

3-wk. summary

f or f' smooth cont. but not both
(Behavior of f or f' dominates graph behavior)

Lab 2

Ratio pre-coordination
Inflection point: Rates of rates

Ratio pre-coordination
Inflection point: Rates of rates

Average R.o.C.

Sigma/n
Classic slope as computation

Bike Problem

Classic slope being averaged

Lab 2

Equivalent constant
(Can perceive graphs on graphs)

Constant R.o.C. Between
2 pts.

Limit

Inf as#
Blank Slate

Intro Wksht.

Fixed #
(small means 1/.01)

Limits Lab

Approximate # within bounds
(Unreachable can be estimated within .001)

Geogebra

Algorithm

Procedural

Delta Notation

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Lab 2

Delta as variation in one variable
($dh < dt$ where dt is fixed results in a decr. Graph)

Derivative Lab

Magnitude
(the need of abs() to find distance not direction between points)

Magnitude

Derivative Lab/1st Exposure

Provide environment to see how dx and dy may vary together simultaneously within dy/dx.

Smooth continuous in both numerator and denominator of dy/dx

Never Confirmed

Constant R.o.C. Between 2 pts.

Lab 2
Ratio pre-coordination
(rise over run is quite literal)

Derivative Lab
Change in y/change in x
Requires 2 pts.
(rise over run happens simultaneously)

Change in y/Change in x

Procedural

Geogebra
Zooming
Proximity
Approximation
(implicitly used through tech.)

Instant Formal Def.
Metaphors having written def.
Lingering "hole" meaning

Strong Approximation Metaphor

Magnitude

Derivative Lab
No defined difference between t and dt.

1st Exposure
Time and dt sometimes synonymous
T and dt being malleable pieces to alter something bigger

Malleable Magnitude

Smooth continuous in both numerator and denominator of dy/dx
Never Confirmed

Change in y /Change in x

Derivative Lab
Acceptable slope within some bound

Strong Approximation Metaphor

Malleable Magnitude

Instantaneous R.o.C. is R.o.C. at a single point

A.R.o.C. Group

An I.R.o.C. is an estimation based upon average R.o.C. defined over pts. being drawn together

Delta Group

An I.R.o.C. is an estimation based upon average R.o.C. defined over some $dx \rightarrow 0$

Bonus

A graph as a visual representation of multiple rates of change