NSSC-II

Supplementary Materials to Understand Mathematics

The following material is collection of links that can be used to play around with the mathematical concepts involved in the class for better understanding. The material is indented to make you understand (for example determinant), rather than computing it (determinant). The link refers to the geogebra resources. More resources can be found on the geogebra website.

Continuity:

This idea is the motivation of all numerical approximations.

https://www.geogebra.org/m/YpqytNphmaterial/d9ymqxvm

What happens if we dont have limit sense?

https://www.geogebra.org/m/YpqytNphmaterial/XkWbC9PH

Derivatives at work:

https://www.geogebra.org/m/YpqytNphmaterial/s8Qu7sng

Descatres view on tangents:

https://www.geogebra.org/m/YpqytNphmaterial/vrznapye

Fermat Insight:

https://www.geogebra.org/m/YpqytNphmaterial/sggg73t2

How about derivatives of cosines and sin? sin(2x), sin(2x+3)?

https://www.geogebra.org/m/YpqytNphmaterial/ezKv36tC

Derivatives of Power curves: Exponentials

https://www.geogebra.org/m/YpqytNphmaterial/Nd9qTNAf

mean value Theorem:

https://www.geogebra.org/m/YpqytNphmaterial/S6qYJPp5

mean value theorem, point C which is guaranteed.

https://www.geogebra.org/m/YpqytNphmaterial/xArbbmUS

Minimization of area: https://www.geogebra.org/m/KZcqsADT

Basis and algebra

Determinant:

https://www.geogebra.org/m/EA4ajBsH

Basis:

https://www.geogebra.org/m/VVdWf2fe

https://www.geogebra.org/m/NNVtN9aW

Eigenvalue: https://www.geogebra.org/m/N78q77VK

eigenvector: https://www.geogebra.org/m/KspERWkw

Deformation of circle using eigenvalues: https://www.geogebra.org/m/DJXTtm2k

Determinant: https://www.geogebra.org/m/xxjuudq4material/qraxa3fd

Gradient:

https://www.geogebra.org/m/rFXjf5fw

https://www.geogebra.org/m/A4HZvzu4

https://www.geogebra.org/m/QhfcuhqA

Directional Derivative and gradient: https://www.geogebra.org/m/VKU7BrFK

Partial derivative: https://www.geogebra.org/m/tQWRhRzn Maxima and minimum property of gradient. https://www.geogebra.org/m/vBNTj7Y2

Cauchy theorem: https://www.geogebra.org/m/NUjTVqPJ

Divergence: https://www.geogebra.org/m/y8xxrw5u

Slope field: explaination of importance of initial value : https://www.geogebra.org/m/gQPQnybf

SLope field: https://www.geogebra.org/m/Gk6dhRvw

Integration by parts: https://www.geogebra.org/m/wkap493f

Initial value problem: https://www.geogebra.org/m/XFgMaKTy

Integration as rotation into third dimension: https://www.geogebra.org/m/mzWq2Cet

Demonstration Examples

slope fields: https://www.geogebra.org/m/bkA2erJsmaterial/ReCtNqhp

https://www.geogebra.org/m/YpqytNphmaterial/pz22MkTb