

CURRICULUM GUIDELINES

999

A: Instructional Division

Date: November 15, 19

New Course: Revision:

Faculty: Department: Faculty of Science

If Revision, Section(s) Revised: sections and

Date of Revision:

Specific objectives:

At the conclusion of this course, the student should be able to

exponential, logarithmic, trigonometric and inverse trigonometric functions by inspection as well as by limit-laws.

- calculate infinite limits and limits at infinity

the intervals of continuity for a given function

- determine

algebraic, trigonometric and inverse trigonometric functions as well as exponential and

- differentiate algebraic

logarithmic functions of any base using differentiation formulae and the chain rule

functions by logarithmic differentiation

differentiate functions

differential to estimate the value of a function in the neighbourhood of a given point and estimate errors

- use a

apply derivatives to solve problems in velocity and acceleration, related rates, and functional extrema

interpret and solve optimisation problems

sketch graphs of functions including rational and exponential functions

identify

Course Content

1. Limits and Continuity

- calculations of limits
- limit theorems
- continuity at a point and on an interval

- essential and removable discontinuities
- intermediate value theorem

2. The Derivative

- rates of change and tangent lines
- differentiation from definition

differentiation formulas and rules

- diff

- implicit differentiation
- higher derivatives
- related rates
- the differential and

differential approximations

- linear approximations

Functions

3. Inverse Functions: Exponential, Logarithmic and Inverse Trigonometric Functions

- definitions, properties, and graphs
- differentiation of logarithmic and exponential functions (any base)
- applications to graphing, extrema, related rates

growth and decay problems

differentiation of inverse trigonometric functions

applications to graphing, extrema, related rates

trigonometric functions

trigonometric

's rule

L'Hôpital's

increasing and decreasing functions

local extrema

Rolle's Theorem and Mean Value Theorem

- curve sketching

- concavity; inflection points

asymptotic behavior of functions at infinity; improper integrals

applied maximum and minimum problems

rectilinear motion

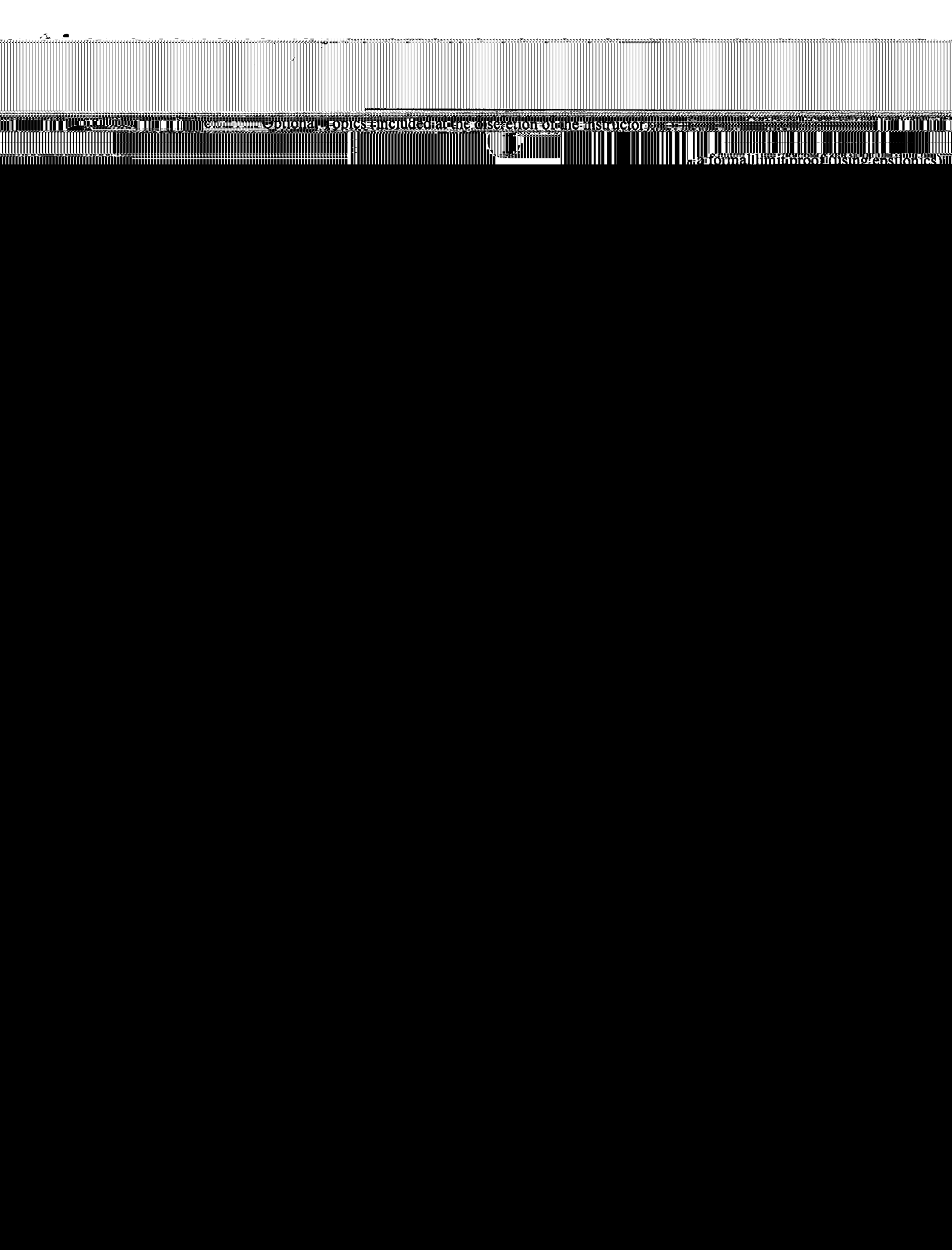
5. Parametric Equations and Polar Coordinates

- parametric representation of curves in \mathbb{R}^2

derivatives and tangent lines of functions in parametric form

definitions and relationships between polar and Cartesian coordinates

graphing of $r = f(\theta)$



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