

Calculus 141, Chapter 6 Summary ~ things you should know

notes by Tim Pilachowski

from Chapters 1-5

limits and continuity

slope of a curve at a point = slope of line tangent to the curve at that point = (instantaneous) rate of change of the curve at that point = first derivative evaluated at that point (notations: $f'(x)$, y' , $\frac{d}{dx}[f(x)]$ and $\frac{dy}{dx}$)

power rule, constant-multiple rule, sum rule

product rule, quotient rule, chain rule

the natural exponential function, $y = e^x$, and the natural logarithm function, $y = \ln x$, with derivatives

integration via antiderivative and via substitution, evaluating definite integrals

from Chapter 6 – Important concepts:

volume of solids of revolution, volumes of solids given the shape of the base and shape of the cross section (memorize the formula)

length of the curve of a given function (memorize the formula)

work done by the force exerted on an object (memorize the general formula), work done to raise object(s) against the force of gravity (memorize the formula for this application)

moments of inertia about the x - and y -axis, center of gravity/center of mass/centroid (memorize the formulae)

parametrized curves, length of a parametrized curve, area of a surface created by revolving a parametrized curve (memorize these formulae)

Be able to:

find the volume of a given solid

find the length of a curve given the function equation and boundaries

find work done given a specific application

find the value of moments of inertia

find the coordinates of the center of gravity of a given shape

sketch a curve given parametrically

find the length and surface area when a curve is given parametrically

Review exercises from the text:

Chapter 5 Review Exercises, numbers 3 – 46 (answers to odd-numbered problems are in the back)

Chapter 6 Review Exercises, numbers 1 – 13, 17 – 22, 25 – 30 and 17 – 22

Chapter 6-Cumulative Review for Chapters 1-5, numbers 1 – 9 and 18 – 21