Integral Calculus (MATH-111)

Department of Mathematics, College of Science, KSU

First Semester: 1447 (August, 2025 – December, 2025)

List of Exercises

**Chapter 3 (Derivatives):**

3.9 Inverse Trigonometric Functions: 22,23,25,28,31,35,36,42,43,44,48

**Chapter 4 (Applications of Derivatives):**

4.4 Indeterminate Forms and l’Hospital’s Rule: 14,20,26,34,36,42,53,55,60,61,62,65

4.8 Antiderivatives: 6,8,12,13,15,16,17,18

**Chapter5 (Integrals):**

5.2 Sigma Notation and Limits of Finite Sums :17,19,31,33,37

5.3 Definite Integral :10,64,66,67,70

5.4 The Fundamental Theorem of Calculus :39,40,42,44,45,47,52 (Please add some exercises related to the Mean Value Theorem)

5.5 Indefinite Integrals and the Substitution Method :17,18,19,21,22,23,24,25,26,32,36,44

5.6: Definite Integral Substitutions and the Area Between Curves :1,2,3,10,11,65,70,75,76,86,101

**Chapter 6 (Applications of Definite Integrals):**

6.1 Volumes Using Cross-Sections :21,23,27,42 ,43,44

6.2 Volumes Using Cylindrical Shells :15,16,19,20,21,22

6.3 Arc Length :1,2,7,9,11,14

6.4 Areas of Surfaces of Revolution :13,14,15,16

**Chapter 7 (Integrals and Transcendental Functions):**

7.1The Logarithm Defined as an Integral :1,2,3,5,6,7,8,14,15,26,27,30,32,37,38,41,45

7.3 Hyperbolic Functions:13,15,18,20,22,23,25,26,27,29,32,33,41,45,47,49,53,56,67,68,69,71,72,73

**Chapter 8 (Techniques of Integration):**

8.1 Using Basic Integration Formulas :

8.2 Integration by Parts :

8.3 Trigonometric Integrals:

8.4 Trigonometric Substitutions:

8.5 Integration of Rational Functions by Partial Fractions :

8.8 Improper Integrals :

**Chapter10 (Parametric Equations and Polar Coordinates):**

10.3: Polar Coordinates.

10.4: Graphing Polar Coordinate Equations.

10.5: Areas and Lengths in Polar Coordinates

∗∗Last updated on September 8, 2025