

THE CALCULUS BOOK 1 - CONTENTS

SECTION NO.	TOPIC	<u>Price</u>
1	THE CALCULUS AND ITS APPLICATIONS	£3.50
	THE CALCULUS	
	Differentiation and Integration	
	Differential Calculus	
	Fundamental Theorem of the Calculus	
	INSTANTANEOUS RATE OF CHANGE	
	DIFFERENTIATION – TECHNIQUE FOR DIFFERENTIATING	
	DIFFERENTIATION – GRADIENT OF TANGENT	
	DIFFERENTIATION – GRADIENT OF NORMAL	
	DIFFERENTIATION – FIRST PRINCIPLES	
	Derived Functions from First Principles – Worked Examples	
	EXERCISE 1	
	EXERCISE 1 – ANSWERS	
	EXERCISE 1 – RIGHT-ANGLED TRIANGLES	
	EXERCISE 1 – WORKED ANSWERS	
2.	STATIONARY POINTS	£5.00
	STATIONARY POINTS: $\frac{dy}{dx} = 0$	
	Maximum Turning Point	
	Minimum Turning Point	
	Point of Inflexion	

FINDING MAXIMUM AND MINIMUM TURNING POINTS

MAXIMUM AND MINIMUM VALUES

Finding Maximum and Minimum Values – Worked Examples

EXERCISE 2

EXERCISE 2 – ANSWERS

SECTION NO.	TOPIC	<u>Price</u>
3.	INTEGRAL CALCULUS – AREA UNDER A CURVE	£4.50

INTEGRATION

– reverse process to differentiation

– given $\frac{dy}{dx}$, to find equation of y

INTEGRATION

– technique for integrating

– finding area under a curve

INDEFINITE INTEGRAL

DEFINITE INTEGRAL

AREA ENCLOSED BETWEEN A LINE AND A CURVE

AREA ENCLOSED BETWEEN TWO CURVES

EXERCISE 3

EXERCISE 3 – ANSWERS

THE CALCULUS BOOK 2 - CONTENTS

SECTION NO.	TOPIC	<u>Price</u>
1	DIFFERENTIATION	£4.50
	THE EXPONENTIAL FUNCTION: $y = e^x$	
	THE NATURAL LOGARITHMIC FUNCTION: $y = \ln x$	
	COMPOSITE FUNCTIONS – THE CHAIN RULE	
	Connected Rates of Change	
	TRIGONOMETRIC FUNCTIONS	
	DIFFERENTIATION OF A PRODUCT	
	DIFFERENTIATION OF A QUOTIENT	
	PRACTICE QUESTIONS	
	PRACTICE QUESTIONS – WORKED ANSWERS	
	DIFFERENTIATION OF IMPLICIT FUNCTIONS	
	DIFFERENTIATION OF PARAMETRIC FUNCTIONS	
	PRACTICE QUESTIONS	
	PRACTICE QUESTIONS – WORKED ANSWERS	
	DIFFERENTIATION OF EXPONENTIAL FUNCTIONS: $y = a^x$	

SECTION NO.	TOPIC	<u>Price</u>
2.	INTEGRATION	£7.50
	TRIGONOMETRIC FUNCTIONS	
	- $\sin x$, $\cos x$ and $\tan x$	
	INTEGRATION BY SUBSTITUTION	
	WORKED EXAMPLES	
	INTEGRATION BY PARTS	
	WORKED EXAMPLES	
	PARTIAL FRACTIONS	
	- linear factors in the denominator	
	- repeated factor in the denominator	
	- use of partial fractions in integration	
	NUMERICAL INTEGRATION	
	- Trapezium Rule	
	- Mid - Ordinate Rule	
	- Simpson's Rule	
	VOLUME OF SOLID OF REVOLUTION	
	WORKED EXAMPLES	
	PRACTICE QUESTIONS	
	PRACTICE QUESTIONS - WORKED ANSWERS	
	DIFFERENTIAL EQUATIONS	
	- separating the variables	
	- Newton's Law of Cooling	
	- worked examples	
	- practice questions	
	- practice questions – worked answers	

- first order – product type
- second order linear
- auxiliary quadratic equation
- particular integral (P.I.)
- complementary function (C.F.)
- arbitrary constants
- worked examples