



NATIONAL OPEN UNIVERSITY OF NIGERIA
FACULTY OF SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS
2024_2 EXAMINATION

COURSE TITLE: ADVANCED MATHEMATICAL ECONOMICS
COURSE CODE: ECO 459
CREDIT UNITS: 2 UNITS
TIME ALLOWED: 2 HOURS
INSTRUCTION: ANSWER ANY THREE (3) QUESTIONS

QUESTION ONE

1a. What is a simultaneous linear equation and its three types? **(5.3 Marks)**

1b. Solve the following quadratic equations, using the quadratic formula: $5x^2 + 23x + 12 = 0$ and the demand and supply equations $Q_s = -20 + 3p$ and $Q_d = 220 - 5p$ **(18 Marks)**

QUESTION TWO

2a. Differentiation of a Constant is...? And differentiate $y = 10x - 7 + x^2$ **(6 Marks)**

2b. For each of the following functions, (1) find the second-order derivative and (2) evaluate it at $x = 2$. (i) $f(x) = (8x - 4)^3$ (ii) $y = (5x^3 - 7x^2)^2$ **(17.3 Marks)**

QUESTION THREE

3a. Solve the following integration equation $\int (x - 9)^{7/2} dx$ **(9.3 Marks)**

3b. Solve the following integration equation $\int \frac{3x^2 + 2}{4x^3 + 8x} dx$ **(14 Marks)**

QUESTION FOUR

4a. According to Prof. Hicks, "Economic dynamics refers to.?" **(3.3 Marks)**

4b. Maximize the following utility functions subject to the given budget constraints,
 $U = x^{0.6}y^{0.25}$, $P_x = 8$, $P_y = 5$, $B = 680$ **(20 Marks)**