

2024 SHS2 END OF SEMESTER EXAMS – MATHEMATICS [ELECTIVE] 2
ELECTIVE MATHEMATICS
PAPER 2

SECTION B (60 marks)

Answer **three** questions **only** from this section. **All** questions carry **equal** marks.

1. a. Find x if $3^{x-1} = 2^{x-1}$
b. Write down the first three terms in the expansion of $(x + b)^n$, where n is a positive integer. If the coefficients of the second and the third terms are -8 and 30 respectively, find the values of n and b
2. a. Draw and indicate by shading the set of all points $P(x, y)$ in the OXY plane that satisfy simultaneously inequalities $y \leq x + 2, y \leq 8 - 2x, x \geq 4 - 2y$
b. Using your graph, find the maximum value of $7x + 4y$
3. a. Find the term independent of x in the expansion of $\left(2x - \frac{1}{x}\right)^{10}$
b. Show that $2 \log_c(a + b) = 2 \log_c a + \log_c \left(1 + \frac{2b}{a} + \frac{b^2}{a^2}\right)$
4. a. Write down in ascending powers of x the binomial expansion of $(2 + x)^5 + (2 - x)^5$.
b. Using the result in (i), evaluate $(2.01)^5 + (1.99)^5$

