

- 4 (i) Find and simplify the first three terms in the binomial expansion of $(2 + ax)^6$ in ascending powers of x . [4]
- (ii) In the expansion of $(3 - 5x)(2 + ax)^6$, the coefficient of x is 64. Find the value of a . [3]



- 8 (a) Use logarithms to solve the equation

$$2^{n-3} = 18000,$$

giving your answer correct to 3 significant figures.

- (b) Solve the simultaneous equations

$$\log_2 x + \log_2 y = 8, \quad \log_2 \left(\frac{x^2}{y} \right) = 7.$$



[4]



[5]