

- 1 Given that $A = \begin{pmatrix} 5 & 3 \\ 6 & 4 \end{pmatrix}$, find the inverse matrix A^{-1} and hence solve the simultaneous equations

$$5x + 3y = 33,$$

$$6x + 4y = 42.$$

[5]

- 2 Find the set of values of m for which the line $y = mx + 5$ does not meet the curve $y = 5(x^2 - x + 2)$.

[6]

- 3 The straight line $y = 4x - 7$ intersects the curve $x^2 + y^2 + xy + 3x = 58$ at points A and B . Find the length of AB .

[7]

- 4 A curve has equation $y = x^3 + ax + b$, where a and b are constants. The gradient of the curve at the point $(3, 32)$ is 30. Find

(i) the value of a and of b , [5]

(ii) the coordinates of the other point on the curve where the gradient is 30. [2]