

1 Further Pure Mathematics 1 – Part 1

— Answers

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1.1 (a) $\alpha + \beta = 8$; (b) $\alpha\beta = 15$.

1.2 $\alpha + \beta = -\frac{6}{2} = -3$; $\alpha\beta = \frac{4}{2} = 2$.

1.3 $\det = 4 \times 5 - 3 \times 2 = 20 - 6 = 14$.

1.4 $\det = 2(1) - 1(1) = 1$, so the inverse is $\begin{pmatrix} 1 & -1 \\ -1 & 2 \end{pmatrix}$.

1.5 It leaves the matrix unchanged (multiplying by I gives the same matrix back).

1.6 $\alpha + \beta = 6$ and $\alpha\beta = 8$, so $\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta = 36 - 16 = 20$.