

MATH 54 Homework 9

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Due Thursday, July 27. This assignment counts as two homeworks, and there will be four graded problems.

- Hill 4.7: 27, 30, 40, 41, 42.
- Hill 5.1: 13, 16, 17, 19, 20, 27, 31, 32, 38.
- Hill 5.2: 3, 5, 7, 8, 9, 10, 11, 12, 23, 25, 27, 29, 30, 31, 33, 35.
- Hill 5.3: 21, 22, 23, 26, 32.
- Hill 5.4: 3, 9, 21.
- Hill 5.5: 3, 4, 5, 12, 13, 14, 15.
- Let A be a 2×2 upper-triangular matrix with all zeroes on the diagonal. Prove that $A^2 = 0$.
- Let A be a 3×3 upper-triangular matrix with all zeroes on the diagonal. Prove that $A^3 = 0$.
- Diagonalize the following matrices.

$$A = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$$

$$B = \begin{pmatrix} 39/2 & 1/2 & -18 \\ -5/2 & 5/2 & 2 \\ 20 & 0 & -18 \end{pmatrix}$$