

HW06 Hints

1. This problem showcases a situation in which EVD enables an economical computation of A^k . The relevant slide, therefore, is p. 20. As for Horner's methods, see Problem 12(b) of Module 2 practice problem set. With a simple modification to the code, it can be used for both scalar and vector inputs.
2. Use Theorem 5 on p. 36. Since A in the problem is a real matrix, $A^* = A^T$. It is your job to determine which one of $A^T A$ or AA^T to use. *Hint.* The problem demands a 2×2 eigenvalue problem.
4. I hope by now that everyone is comfortable creating a Vandermonde-type matrix; see also Problem 3 of HW5. The semi-log plot for part (b) should plot singular values (vertical axis) against integers $1, \dots, 25$ (horizontal axis). The vertical axis need to be in log scale, so use `semilogy`, *e.g.*,

```
semilogy( <indices>, <singular values> )
```