MATH 54 Homework 2

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Due Friday, June 30.

- Hill 1.3: 1, 3, 9, 11, 15, 16, 24, 32.
- Hill 1.4: 2, 9, 13, 14, 29, 32, 33, 36, 38[1], 39, 40, 48, 49.
- Hill 1.6: 14, 20, 22.
- Let z_0 and z_1 be any two complex numbers. Prove that $\overline{z_0 + z_1} = \overline{z_0} + \overline{z_1}$ and $\overline{(z_0 z_1)} = (\overline{z_0})(\overline{z_1})$.
- Let z_0 be any complex number, and let z_1 be any nonzero complex number. Prove that $\overline{(z_0/z_1)} = \overline{z_0}/\overline{z_1}$. [Hint: First prove that $\overline{(1/z_1)} = 1/\overline{z_1}$. Then use the result of the previous problem.]
- Compute the inverses of the following matrices.

$$A = \begin{pmatrix} i & 1 \\ 1+i & 1 \end{pmatrix}$$

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

[1] There is a typo in this problem. The question at the end of the problem should be, "Can you find D^{-1}?"