Required textbook problems (hand these in):

1. §2.1: 27.
2. §2.2: 2, 7, 13, 14, 15, 18, 30, 31, 32, 33.
3. Write $\begin{bmatrix} 5 & 10 \\ 4 & 7 \end{bmatrix}$ and $\begin{bmatrix} 1 & 0 & -2 \\ -3 & 1 & 4 \\ 2 & -3 & 4 \end{bmatrix}$ as products of elementary matrices.
4. §2.3: 3, 4, 15, 16, 17, 18, 19, 26, 34, 36, 38.
5. §2.4: 1, 2.
6. §2.5: 1, 2, 8, 9, 10.

Suggested practice (don’t hand these in):

- Please read and make sure you can do the practice problems in section 2.2, 2.3, 2.4, 2.5.
- Please read and use for review problems 2.2.9, 2.2.10, 2.3.11–2.3.14, 2.4.11, and 2.4.12.
- If you had trouble or got help with any of the assigned problems, solve another, similar problem (or two).

**Bonus points.** As usual, bonus points for learning Sage.

1. Follow the steps in the post “Matrix algebra 2”.
2. Use Sage to check your answer to problem (3) above.
3. Use Sage to solve problem 2.5.31.
4. Use Sage to create a random 15 × 15 sparse matrix $A$, with the command:
   
   $A = \text{random\_matrix}(\text{ZZ}, 15, \text{density}=0.25)$
   
   (You can adjust what fraction of the entries are non-zero by adjusting the density setting.) Have Sage compute the LU factorization of $A$ and the inverse of $A$.

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