Group work on h/w assignments is not allowed. No credit is given for results without a solution or an explanation. Late homework is not accepted.

Section 3.3

Problem 6. Find the projection of $b$ onto the column space of $A$. Split $b$ into $p+q$, with $p$ in the column space and $q$ perpendicular to that space. Which of the four subspaces contains $q$?

Problem 24. Find the best straight-line fit to the following measurements, and sketch your solution: $y=-2$ at $t=-1$, $y=0$ at $t=0$, $y=-3$ at $t=1$, $y=-5$ at $t=2$.

Section 4.2

Problem 2. If a $3x3$ matrix has $\det A = -1$, find $\det(A/2)$, $\det(-A)$, $\det(A^2)$, $\det(A^{-1})$

Problem 4. By applying row operations to produce an upper triangular $U$, compute … Exchange rows 3 and 4 of the second matrix and recomputed the pivots and determinant.

Problem 5. Count row exchanges to compute these determinants: $\det[...]=+1$, $\det[...]=-1$.

Problem 10. If $Q$ is an orthogonal matrix, so that $Q^T Q = I$, prove that $\det Q$ equals $+1$ or $-1$. What kind of box is formed from the rows (or columns) of $Q$?