

Answers to Even Assigned Problems in Homework Assignment #1

Section 1.2

Problem #	Answer
4	$\begin{bmatrix} \mathbf{1} & 0 & -1 & 0 \\ 0 & \mathbf{1} & 2 & 0 \\ 0 & 0 & 0 & \mathbf{1} \end{bmatrix} . \text{ Pivot cols 1, 2, and 4: } \begin{bmatrix} \mathbf{1} & 3 & 5 & 7 \\ 3 & \mathbf{5} & 7 & 9 \\ 5 & 7 & 9 & \mathbf{1} \end{bmatrix} .$
6	$\begin{bmatrix} \square & * \\ 0 & \square \\ 0 & 0 \end{bmatrix} , \begin{bmatrix} \square & * \\ 0 & 0 \\ 0 & 0 \end{bmatrix} , \begin{bmatrix} 0 & * \\ 0 & 0 \\ 0 & 0 \end{bmatrix}$
8	$\begin{cases} x_1 = -9 \\ x_2 = 4 \\ x_3 \text{ is free} \end{cases}$
10	$\begin{cases} x_1 = -4 + 2x_2 \\ x_2 \text{ is free} \\ x_3 = -7 \end{cases}$
12	$\begin{cases} x_1 = 5 + 7x_2 \\ x_2 \text{ is free} \\ x_3 = -3 + 2x_4 \\ x_4 \text{ is free} \end{cases}$
16	<p>a. A unique solution b. Consistent, with many solutions</p>
18	$h \neq -15$
20	<p>a. Inconsistent when $h = 9$ and $k \neq 6$ b. Unique solution when $h \neq 9$ c. Many solutions when $h = 9$ and $k = 6$</p>
24	<p>The system is inconsistent because the pivot in column 5 means that there is a row of the form $[0 \ 0 \ 0 \ 0 \ 1]$. Since the matrix is the augmented matrix for a system, Theorem 2 shows that system has no solution.</p>
28	<p>Every column in the augmented matrix except the rightmost column is a pivot column, and the rightmost column is not a pivot column.</p>