Score: 1 of 1 pt | 1 of 6 | Test Score: 100%, 6 of 6 pts

3.1.7

Compute the determinant using a cofactor expansion down the first column.

$$A = \begin{bmatrix} 3 & -5 & 2 \\ 7 & 1 & 3 \\ 0 & 4 & -2 \end{bmatrix}$$

Determine the value of the first term in the cofactor expansion. Substitute the value for a_{11} and complete the matrix for C_{11} below.

$$a_{11}C_{11} = (3)\det\begin{bmatrix} 1 & 3 \\ 4 & -2 \end{bmatrix}$$

Determine the value of the second term in the cofactor expansion. Substitute the value for a_{21} and complete the matrix for C_{21} below.

$$a_{21}C_{21} = -(7)\det\begin{bmatrix} -5 & 2 \\ 4 & -2 \end{bmatrix}$$

Determine the value of the third term in the cofactor expansion. Substitute the value for a_{31} and complete the matrix for C_{31} below.

$$a_{31}C_{31} = (0)\det\begin{bmatrix} -5 & 2 \\ 1 & 3 \end{bmatrix}$$

Complete the cofactor expansion to compute the determinant.

det A = -56

Score: 1 of 1 pt | 2 of 6 | Test Score: 100%, 6 of 6 pts

3.1.9

Compute the determinant by cofactor expansion. At each step, choose a row or column that involves the least amount of computation.

$$\begin{vmatrix} 7 & 0 & 0 & 5 \\ 1 & 8 & 3 & -9 \\ 3 & 0 & 0 & 0 \\ 4 & 2 & 1 & 6 \end{vmatrix}$$

$$\begin{vmatrix} 7 & 0 & 0 & 5 \\ 1 & 8 & 3 & -9 \\ 3 & 0 & 0 & 0 \\ 4 & 2 & 1 & 6 \end{vmatrix} = 30$$ (Simplify your answer.)

Score: 1 of 1 pt | 3 of 6 | Test Score: 100%, 6 of 6 pts

3.2.18

If $\begin{vmatrix} a & b & c \\ d & e & f \\ g & h & i \end{vmatrix} = 4$, find the determinant of $\begin{vmatrix} a & b & c \\ g & h & i \\ d & e & f \end{vmatrix}$.

The determinant is -4.

Score: 1 of 1 pt | 4 of 6 | **Test Score:** 100%, 6 of 6 pts

3.2.25

Use determinants to decide if the set of vectors is linearly independent.

$$\begin{bmatrix} 4 \\ -7 \\ 6 \end{bmatrix}, \begin{bmatrix} -5 \\ 8 \\ 4 \end{bmatrix}, \begin{bmatrix} 4 \\ 0 \\ -8 \end{bmatrix}$$

The determinant of the matrix whose columns are the given vectors is -280.
(Simplify your answer.)

Is the set of vectors linearly independent? Choose the correct answer below.

- A. The set of vectors is linearly independent, because the determinant exists.
- B. The set of vectors is linearly dependent, because the determinant exists.
- ✔ C. The set of vectors is linearly independent, because the determinant is not zero.
- D. The set of vectors is linearly dependent, because the determinant is not zero.

Score: 1 of 1 pt | 5 of 6 | **Test Score:** 100%, 6 of 6 pts

3.3.6

Use Cramer's rule to compute the solution of the system.

$$\begin{aligned} 2x_1 + 5x_2 + 3x_3 &= 8 \\ 3x_1 \qquad\quad + x_3 &= 2 \\ 5x_1 + x_2 \qquad\quad &= 2 \end{aligned}$$

$x_1 = \frac{1}{4}$; $x_2 = \frac{3}{4}$; $x_3 = \frac{5}{4}$
(Type integers or simplified fractions.)

Score: 1 of 1 pt | 6 of 6 | **Test Score:** 100%, 6 of 6 pts

3.3.15

Compute the adjugate of the given matrix, and then use the Inverse Formula to give the inverse of the matrix.

$$A = \begin{bmatrix} 5 & 0 & 0 \\ -3 & 1 & 0 \\ -4 & 2 & 1 \end{bmatrix}$$

The adjugate of the given matrix is $\text{adj } A = \begin{bmatrix} 1 & 0 & 0 \\ 3 & 5 & 0 \\ -2 & -10 & 5 \end{bmatrix}$.

The inverse of the given matrix is $A^{-1} = \begin{bmatrix} \frac{1}{5} & 0 & 0 \\ \frac{3}{5} & 1 & 0 \\ -\frac{2}{5} & -2 & 1 \end{bmatrix}$.

(Simplify your answers.)