Problem 7e, pg 257.

```
with(LinearAlgebra):
A := Matrix([[1, 3, 2, 1], [4, 2, 1, 2], [2, 1, 2, 3], [1, 2, 4, 1]]):
b := <-2, 2, 1, -1>
```

$$b := \begin{bmatrix} -2 \\ 2 \\ 1 \\ -1 \end{bmatrix} \tag{1.1}$$

```
GaussianElimination(<A | b>)
```

$$\begin{bmatrix} 1 & 3 & 2 & 1 & -2 \\ 0 & -10 & -7 & -2 & 10 \\ 0 & 0 & \frac{3}{2} & 2 & 0 \\ 0 & 0 & 0 & -\frac{17}{5} & 0 \end{bmatrix} \tag{1.2}$$

```
x_soln := BackwardSubstitute((1.2))
```

$$x_{soln} := \begin{bmatrix} 1 \\ -1 \\ 0 \\ 0 \end{bmatrix} \tag{1.3}$$

```
A . x_soln = b
```

$$\begin{bmatrix} -2 \\ 2 \\ 1 \\ -1 \end{bmatrix} = \begin{bmatrix} -2 \\ 2 \\ 1 \\ -1 \end{bmatrix} \tag{1.4}$$

Old package

linalg[*ffgausselim*]($\langle A|b \rangle$)

$$\begin{bmatrix} 1 & 3 & 2 & 1 & -2 \\ 0 & -5 & -2 & 1 & 5 \\ 0 & 0 & 15 & 20 & 0 \\ 0 & 0 & 0 & -51 & 0 \end{bmatrix} \tag{2.1}$$

linalg[*backsub*](%)

$$\begin{bmatrix} 1 & -1 & 0 & 0 \end{bmatrix} \tag{2.2}$$