EXAMPLE

$$\begin{aligned} x_1 + 6x_2 \qquad + 3x_4 \quad &= 0 \\ x_3 - 8x_4 \quad &= 5 \\ x_5 &= 7 \end{aligned} \qquad \begin{cases} x_1 = -6x_2 - 3x_4 \\ x_2 \text{ is free} \\ x_3 = 5 + 8x_4 \\ x_4 \text{ is free} \\ x_5 = 7 \end{cases}$$

The **general solution** of the system provides a parametric description of the solution set. (The free variables act as parameters.)

BACK-SUBSTITUTION

The following system is in echelon form but is *not* in reduced echelon form.

$$\begin{aligned} x_1 - 7x_2 + 2x_3 - 5x_4 + 8x_5 &= 10 \\ x_2 - 3x_3 + 3x_4 + x_5 &= -5 \\ x_4 - x_5 &= 4 \end{aligned}$$

The backward phase of row reduction, to reduced echelon form, is equivalent to back-substitution. Use only the **reduced** echelon form to solve a system.