In Problems 1–12 find the general solution of the given system.

5.

$$\mathbf{X}' = \begin{bmatrix} 10 & -5 \\ 8 & -12 \end{bmatrix} \mathbf{X}$$

7.

$$\begin{aligned} \frac{dx}{dt} &= x + y - z \\ \frac{dy}{dt} &= 2y \\ \frac{dz}{dt} &= y - z \end{aligned}$$

12.

$$\mathbf{X}' = \begin{bmatrix} -1 & 4 & 2 \\ 4 & -1 & -2 \\ 0 & 0 & 6 \end{bmatrix} \mathbf{X}$$

In Problems 21–30 find the general solution of the given system.

23.

$$\mathbf{X}' = \begin{bmatrix} -1 & 3 \\ -3 & 5 \end{bmatrix} \mathbf{X}$$

25.

$$\begin{aligned} \frac{dx}{dt} &= 3x - y - z \\ \frac{dy}{dt} &= x + y - z \\ \frac{dz}{dt} &= x - y + z \end{aligned}$$

28.

$$\mathbf{X}' = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 3 & 1 \\ 0 & -1 & 1 \end{bmatrix} \mathbf{X}$$

In Problems 35–46 find the general solution of the given system.

37.

$$\begin{aligned} \frac{dx}{dt} &= 5x + y \\ \frac{dy}{dt} &= -2x + 3y \end{aligned}$$

40.

$$\mathbf{X}' = \begin{bmatrix} 1 & -8 \\ 1 & -3 \end{bmatrix} \mathbf{X}$$

43.

$$\mathbf{X}' = \begin{bmatrix} 1 & -1 & 2 \\ -1 & 1 & 0 \\ -1 & 0 & 1 \end{bmatrix} \mathbf{X}$$