

Exercise 25

Verify Cramer's rule.

Solution

Use Cramer's rule to solve the system of equations,

$$\begin{aligned}x + 2y &= 3 \\4x + 5y &= 6.\end{aligned}$$

The rule yields

$$x = \frac{\begin{vmatrix} 3 & 2 \\ 6 & 5 \end{vmatrix}}{\begin{vmatrix} 1 & 2 \\ 4 & 5 \end{vmatrix}} = \frac{15 - 12}{5 - 8} = \frac{3}{-3} = -1$$

$$y = \frac{\begin{vmatrix} 1 & 3 \\ 4 & 6 \end{vmatrix}}{\begin{vmatrix} 1 & 2 \\ 4 & 5 \end{vmatrix}} = \frac{6 - 12}{5 - 8} = \frac{-6}{-3} = 2.$$

Both values satisfy each equation, so Cramer's rule is verified.