

$$\begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$$

Find the value of each determinant.

$$1) \begin{vmatrix} 3 & 5 \\ 11 & -7 \end{vmatrix} =$$

$$2) \begin{vmatrix} 2 & 4 \\ 3 & 5 \end{vmatrix} =$$

$$3) \begin{vmatrix} 9 & -1 \\ -18 & 2 \end{vmatrix} =$$

$$4) \begin{vmatrix} 4.22 & 6.17 \\ 11.91 & 4.07 \end{vmatrix} =$$

$$5) \begin{vmatrix} 301 & 48 \\ 601 & 192 \end{vmatrix} =$$

$$\begin{aligned} \begin{vmatrix} a & b & c \\ d & e & f \\ g & h & i \end{vmatrix} &= a \begin{vmatrix} e & f \\ h & i \end{vmatrix} - b \begin{vmatrix} d & f \\ g & i \end{vmatrix} + c \begin{vmatrix} d & e \\ g & h \end{vmatrix} \\ &= a(ei - fh) - b(di - fg) + c(dh - eg) \end{aligned}$$

Find the determinant of each.

$$6) \begin{vmatrix} 4 & 7 & 8 \\ 2 & 1 & 3 \\ 5 & 5 & 6 \end{vmatrix} =$$

$$7) \begin{vmatrix} 3 & 4 & -7 \\ 0 & 6 & -2 \\ -2 & 3 & 1 \end{vmatrix} =$$

Cramer's Rule:

$$\begin{cases} a_1x + b_1y = c_1 \\ a_2x + b_2y = c_2 \end{cases} \quad x = \frac{\begin{vmatrix} c_1 & b_1 \\ c_2 & b_2 \end{vmatrix}}{\begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix}} \quad y = \frac{\begin{vmatrix} a_1 & c_1 \\ a_2 & c_2 \end{vmatrix}}{\begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix}}$$

Solve the systems below using Cramer's rule.

$$8) \begin{cases} 4x + 7y = -5 \\ 8x - 3y = 11 \end{cases}$$

$$9) \begin{cases} 4.3x - 9.4y = 83.7 \\ 1.2x + 14.1y = 91.2 \end{cases}$$

$$\begin{cases} a_1x + b_1y + c_1z = d_1 \\ a_2x + b_2y + c_2z = d_2 \\ a_3x + b_3y + c_3z = d_3 \end{cases} \quad x = \frac{\begin{vmatrix} d_1 & b_1 & c_1 \\ d_2 & b_2 & c_2 \\ d_3 & b_3 & c_3 \end{vmatrix}}{\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}} \quad y = \frac{\begin{vmatrix} a_1 & d_1 & c_1 \\ a_2 & d_2 & c_2 \\ a_3 & d_3 & c_3 \end{vmatrix}}{\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}} \quad z = \frac{\begin{vmatrix} a_1 & b_1 & d_1 \\ a_2 & b_2 & d_2 \\ a_3 & b_3 & d_3 \end{vmatrix}}{\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}}$$

$$\begin{vmatrix} a & b & c \\ d & e & f \\ g & h & i \end{vmatrix} = a \begin{vmatrix} e & f \\ h & i \end{vmatrix} - b \begin{vmatrix} d & f \\ g & i \end{vmatrix} + c \begin{vmatrix} d & e \\ g & h \end{vmatrix}$$

Solve the system using Cramer's rule.

$$10) \begin{cases} 11x - 5y + z = -7 \\ 8x + 5y - 3z = 2 \\ x - 10y + 6z = 1 \end{cases}$$