Determinants – Cramer’s Rule

Solve the following system of equations using Cramer’s rule:

\[
\begin{align*}
\frac{2}{3}x + 4y + \frac{3}{2}z &= 34 \\
\frac{1}{2}x - \frac{3}{2}y + 2z &= 9 \\
\frac{3}{2}x + \frac{1}{3}y - \frac{1}{2}z &= -22
\end{align*}
\]

\[
\begin{align*}
\frac{2}{3}x + \frac{3}{5}y + \frac{5}{3}z &= -10 \\
\frac{4}{3}x + \frac{1}{10}y + 2z &= -\frac{5}{2} \\
\frac{2}{9}x + 4y - \frac{2}{3}z &= -\frac{-34}{3}
\end{align*}
\]

\[
\Delta =
\]
\[
\Delta x =
\]
\[
\Delta y =
\]
\[
\Delta z =
\]

\[
\begin{align*}
-\frac{7}{4}x - \frac{5}{3}y + 2z &= \frac{1}{2} \\
\frac{5}{2}x + \frac{2}{3}y - \frac{7}{5}z &= \frac{4}{3} \\
4x - \frac{8}{3}y + 3z &= -\frac{10}{9}
\end{align*}
\]

\[
\Delta =
\]
\[
\Delta x =
\]
\[
\Delta y =
\]
\[
\Delta z =
\]

PREVIEW

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Answer key

Determinants – Cramer’s Rule

Three Variables: DS1

\[
\begin{align*}
\frac{2}{3}x + 4y + \frac{3}{2}z &= 34 \\
\frac{1}{2}x - \frac{3}{2}y + 2z &= 9 \\
\frac{3}{2}x + \frac{1}{3}y - \frac{1}{2}z &= -22 \\
\frac{2}{3}x + \frac{3}{5}y + \frac{5}{3}z &= -10 \\
\frac{4}{3}x + \frac{1}{10}y + 2z &= -\frac{5}{2} \\
\frac{2}{9}x + 4y - \frac{2}{3}z &= -\frac{34}{3}
\end{align*}
\]

\[
\Delta = \frac{1201}{72}
\]

\[
\Delta x = \frac{-1201}{6}; \Delta y = \frac{-577}{15}; \Delta z = -9
\]

\[
x = \frac{\Delta x}{\Delta} = -12; y = \frac{\Delta y}{\Delta} = -\frac{577}{15}; z = \frac{\Delta z}{\Delta} = -9
\]

\[
\frac{-7}{4}x - \frac{5}{3}y + 2z = \Delta
\]

\[
\frac{5}{2}x + \frac{2}{3}y - \frac{7}{5}z = \Delta
\]

\[
4x - \frac{8}{3}y + 3z = \Delta
\]

\[
\Delta = \frac{31}{5}
\]

\[
\Delta x = \frac{248}{5}; \Delta y = \frac{267}{5}; \Delta z = 8
\]

\[
x = \frac{\Delta x}{\Delta} = 8; y = \frac{\Delta y}{\Delta} = \frac{267}{5}; z = \frac{\Delta z}{\Delta} = 8
\]

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