

Name: ANSWER KEY

Score: _____

Solve the following system by the method of Gauss-Jordan or the method of Gauss.
Solutions by any other method will not be counted.

$$\begin{cases} 3x + y + 2z = 31 \\ x + y + 2z = 19 \\ x + 3y + 2z = 25 \end{cases}$$

$$\begin{aligned} & \left(\begin{array}{ccc|c} 3 & 1 & 2 & 31 \\ 1 & 1 & 2 & 19 \\ 1 & 3 & 2 & 25 \end{array} \right) \xrightarrow{\textcircled{1} \leftrightarrow \textcircled{2}} \left(\begin{array}{ccc|c} \textcircled{1} & 1 & 2 & 19 \\ 3 & 1 & 2 & 31 \\ 1 & 3 & 2 & 25 \end{array} \right) \xrightarrow{\begin{array}{l} -3\textcircled{1} + \textcircled{2} \\ \rightarrow \textcircled{2} \\ -1\textcircled{1} + \textcircled{3} \\ \rightarrow \textcircled{3} \end{array}} \left(\begin{array}{ccc|c} 1 & 1 & 2 & 19 \\ 0 & -2 & -4 & -26 \\ 0 & 2 & 0 & 6 \end{array} \right) \\ & \xrightarrow{\begin{array}{l} -\frac{1}{2}\textcircled{2} \\ \frac{1}{3}\textcircled{3} \end{array}} \left(\begin{array}{ccc|c} 1 & 1 & 2 & 19 \\ 0 & 1 & 2 & 13 \\ 0 & 1 & 0 & 3 \end{array} \right) \xrightarrow{\textcircled{2} \leftrightarrow \textcircled{3}} \left(\begin{array}{ccc|c} 1 & 1 & 2 & 19 \\ 0 & 1 & 0 & 3 \\ 0 & 1 & 2 & 13 \end{array} \right) \xrightarrow{\begin{array}{l} \textcircled{1} - \textcircled{2} \rightarrow \textcircled{2} \\ \textcircled{3} - \textcircled{2} \rightarrow \textcircled{3} \end{array}} \left(\begin{array}{ccc|c} 1 & 0 & 2 & 16 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 2 & 10 \end{array} \right) \\ & \xrightarrow{\frac{1}{2}\textcircled{3}} \left(\begin{array}{ccc|c} 1 & 0 & 2 & 16 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & 5 \end{array} \right) \xrightarrow{\begin{array}{l} -2\textcircled{3} + \textcircled{1} \\ \rightarrow \textcircled{1} \end{array}} \left(\begin{array}{ccc|c} 1 & 0 & 0 & 6 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & 5 \end{array} \right) \end{aligned}$$

$$x = 6$$

$$y = 3$$

$$z = 5$$