Workout 2

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$$\begin{pmatrix} 1 & -1 & 2 \\ 0 & 1 & -1 \\ 3 & 2 & 0 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 7 \\ 3 \\ -3 \end{pmatrix}$$

$$\begin{pmatrix} 1 & -1 & 2 & 7 \\ 3 & 2 & 0 & -3 \\ 0 & 1 & -1 & 3 \end{pmatrix} \sim \begin{pmatrix} 3 & 2 & 0 & -3 \\ 0 & 1 & -1 & 3 \\ 1 & -1 & 2 & 7 \end{pmatrix}$$

$rad3 - \frac{1}{3} * rad1$

$$\begin{pmatrix} 3 & 2 & 0 & -3 \\ 0 & 1 & -1 & 3 \\ 0 & -\frac{5}{3} & 2 & 8 \end{pmatrix} \sim \begin{pmatrix} 3 & 2 & 0 & -3 \\ 0 & -\frac{5}{3} & 2 & 8 \\ 0 & 1 & -1 & 3 \end{pmatrix}$$

$rad3 - \left(-\frac{5}{3}\right) * rad2$

$$\begin{pmatrix} 3 & 2 & 0 & -3 \\ 0 & -\frac{5}{3} & 2 & 8 \\ 0 & 0 & \frac{1}{5} & \frac{39}{5} \end{pmatrix} \sim \begin{pmatrix} 3 & 2 & 0 & -3 \\ 0 & -\frac{5}{3} & 2 & 8 \\ 0 & 0 & 1 & 39 \end{pmatrix}$$

3x - 2y = -3
-$\frac{5}{3}$y + 2z = 8
z = 39
$\Longleftrightarrow$
x = -29
y = 42
z = 39

$$\begin{pmatrix} 1 & -1 & 2 \\ 3 & 2 & 0 \\ 0 & 1 & -1 \end{pmatrix} \sim \begin{pmatrix} 3 & 2 & 0 \\ 0 & 1 & -1 \\ 1 & -1 & 2 \end{pmatrix} P = [3, 2, 1]$$

$rad3 - \frac{1}{3} * rad1$
$rad2 - 0 * rad1$

$$\begin{pmatrix} 3 & 2 & 0 \\ 0 & 1 & -1 \\ 0 & -\frac{5}{3} & 2 \end{pmatrix} \sim \begin{pmatrix} 3 & 2 & 0 \\ 0 & -\frac{5}{3} & 2 \\ 0 & 1 & -1 \end{pmatrix} P = [3, 1, 2]$$

$rad3 - \left(-\frac{5}{3}\right) * rad2$

$$U = \begin{pmatrix} 3 & 2 & 0 \\ 0 & -\frac{5}{3} & 2 \\ 0 & 0 & \frac{1}{5} \end{pmatrix}$$

$$L = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ \frac{1}{3} & -\frac{5}{3} & 1 \end{pmatrix}$$

$$P = \begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$$

$$b = \begin{pmatrix} 7 \\ 3 \\ -3 \end{pmatrix}$$