

## MATH 54 – SOLUTION TO 4.7.9

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First, we want to find  $\mathcal{C} \stackrel{P}{\leftarrow} \mathcal{B}$ . For this, row-reduce:

$$[\mathcal{C} \mid \mathcal{B}] = \begin{bmatrix} 2 & -2 & 4 & 8 \\ 2 & 2 & 4 & 4 \end{bmatrix} \longrightarrow \begin{bmatrix} 1 & 0 & 2 & 3 \\ 0 & 1 & 0 & -1 \end{bmatrix}$$

Therefore:

$$\mathcal{C} \stackrel{P}{\leftarrow} \mathcal{B} = \begin{bmatrix} 2 & 3 \\ 0 & -1 \end{bmatrix}$$

And then:

$$\mathcal{B} \stackrel{P}{\leftarrow} \mathcal{C} = \left( \mathcal{C} \stackrel{P}{\leftarrow} \mathcal{B} \right)^{-1} = \begin{bmatrix} 2 & 3 \\ 0 & -1 \end{bmatrix}^{-1} = -\frac{1}{2} \begin{bmatrix} -1 & -3 \\ 0 & 2 \end{bmatrix} = \begin{bmatrix} \frac{1}{2} & \frac{3}{2} \\ 0 & -1 \end{bmatrix}$$