

3. Find the value(s) of t for which $(1, 2, 3, t)$ lies in the subspace spanned by $(1, 0, 1, 2)$, $(0, 1, 1, 2)$ and $(1, 1, 0, 2)$.

A. $t = 4$ or 6

B. $t = 4$ only

C. $t = 6$ only

D. $t = -2$ or -4

E. $t = 0$ or 2

F. $t = -2, 0$ or 4

$$\left[\begin{array}{ccc|c} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 2 \\ 1 & 1 & 0 & 3 \\ 2 & 2 & 2 & t \end{array} \right] \sim \left[\begin{array}{ccc|c} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 2 \\ 0 & -1 & -1 & -2 \\ 0 & -2 & 0 & 2-t \end{array} \right] \sim \left[\begin{array}{ccc|c} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 2 \\ 0 & 0 & 2 & 0 \\ 0 & 0 & -2 & 6-t \end{array} \right]$$

$$R_1 - R_3 \rightarrow R_3$$

$$R_2 - R_3 \rightarrow R_3$$

$$2R_1 - R_4 \rightarrow R_4$$

$$-2R_3 + R_4 \rightarrow R_4$$

$$\left[\begin{array}{ccc|c} 1 & 0 & 1 & 2 \\ 0 & 1 & 1 & 2 \\ 1 & 1 & 0 & 2 \\ 1 & 2 & 3 & t \end{array} \right] \sim \left[\begin{array}{ccc|c} 1 & 0 & 1 & 2 \\ 0 & 1 & 1 & 2 \\ 0 & -1 & -1 & 0 \\ 0 & -2 & -2 & t-2 \end{array} \right] \sim \left[\begin{array}{ccc|c} 1 & 0 & 1 & 2 \\ 0 & 1 & 1 & 2 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 6-t \end{array} \right]$$

$$R_1 - R_3 \rightarrow R_3$$

$$R_2 + R_3 \rightarrow R_3$$

$$R - R_4 \rightarrow R_4$$

$$2R_2 + R_3 \rightarrow R_3$$