

RRLF:

0	0	1	x	0	x	x	0
0	0	0	0	1	x	x	0
0	0	0	0	0	1	x	0
0	0	0	0	0	0	0	1

$$A = \begin{bmatrix} 1 & 1 \\ 2 & -1 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}.$$

$$\begin{aligned} A^2 &= \begin{bmatrix} 1 & 1 \\ 2 & -1 \end{bmatrix} \begin{bmatrix} 1 & 1 \\ 2 & -1 \end{bmatrix} = \begin{bmatrix} -4 & 2 \\ 3 & 7 \end{bmatrix} \\ &= \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix} + B \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \end{aligned}$$

Find all values of k such that the linear system with augmented matrix

$$\begin{array}{ccccc|c} x & y & z & v & w & \\ \hline 1 & 2 & 0 & 0 & 5 & 1 \\ 0 & 0 & 1 & 0 & 6 & -1 \\ 0 & 0 & 0 & 1 & 0 & 3 \\ 0 & 0 & 0 & 0 & k^2 - 4 & 0 \end{array}$$

has a 2-parameter family of solutions.

- ☐ A. $k = \pm 2$ only
☐ B. all $k \neq 2$
☐ C. all $k \neq -2$
☒ D. all $k \neq \pm 2$
☐ E. No value of k gives a 2-parameter family of solutions.

答案:A

$$\begin{array}{ccccc|c} a & b & d & e & & \\ \hline 1 & 0 & 2 & 5 & 0 & 0 \\ 0 & 1 & 0 & 1 & 3 & 0 \\ 0 & 0 & 0 & 0 & c^2 - 9 & c + 3 \end{array}$$

be the augmented matrix for a system of 3 linear equations in 5 unknowns. For what value of c does the linear system

have a 2-parameter family of solutions?

- ☒ A. $c = 3$
☐ B. $c = -3$
☐ C. $c = \pm 3$
☐ D. $c \neq \pm 3$
☐ E. no value of c

答案:D

$$\begin{aligned} a + 2d + 5e &= 0 \\ b + d + 3e &= 0 \\ (c^2 - 9)e &= c + 3 \end{aligned}$$

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$a + 2d + 5e = 0$
 $b + d + 3e = 0$
 $(c^2 - 9)e = c + 3$
 $c = 3$
 $c \neq \pm 3$

Let $\left[\begin{array}{ccccc|c} 1 & 0 & 1 & 2 & 5 & 0 \\ 0 & 1 & 0 & 1 & 3 & 0 \\ 0 & 0 & 0 & 0 & c^2-9 & c+3 \end{array} \right]$ be the augmented matrix for a system of 3 linear equations in 5 unknowns. For what value of c does the linear system

have a 2-parameter family of solutions?

- ☒ A. $c = 3$
- ☐ B. $c = -3$
- ☐ C. $c = \pm 3$
- ☐ D. $c \neq \pm 3$
- ☐ E. no value of c

Answer: D