


向量.

1.

$$X = k \begin{pmatrix} 1 \\ 2 \\ -3 \end{pmatrix}$$

$$2_1 + 2_2 + 22_3 - 32_4 = 0$$

$$2_2 \sim 32_4 - 22_3 - 2_1$$

2.

$$2_1 + 22_2 + 42_3$$

$$22_2 + 2_2 \sim 2_3$$

$$2_2 + 2_3$$

$$(2_1, 2_2, 2_3) \left(\begin{array}{ccc|c} 1 & 2 & 0 & \\ 9 & 1 & 1 & \\ 4 & -1 & 1 & \end{array} \right)$$

相关

$$r < 3.$$

$$\begin{vmatrix} 1 & 2 & 0 \\ a & 1 & 1 \\ 4 & -1 & 1 \end{vmatrix} = 0 \quad a \neq 1.$$

3. $\alpha = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} \quad \beta = \begin{pmatrix} 3 \\ 2 \\ 1 \end{pmatrix} \quad \gamma = \begin{pmatrix} b+2 \\ a-4 \\ 9 \end{pmatrix} \quad \alpha, \beta, \gamma \text{ 两两正交}$

$$3 + 2a + 2b = 0$$

$$b + 2 + 2a - 8 + 2b = 0$$

$$3b + 6 + 4a - 6a - 4b = 0$$

$$a = -4 \quad b = -13$$

4.

$$\varepsilon_1 = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} \quad \varepsilon_2 = \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix} \quad \varepsilon_3 = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$$

$$(\varepsilon_1 \varepsilon_2 \varepsilon_3) Q = (e_1, e_2, e_3)$$

一种看成初等行变换

$$Q = (\varepsilon_1, \varepsilon_2, \varepsilon_3)^{-1} (e_1, e_2, e_3)$$



$$\left(\begin{array}{ccc|ccc} 1 & 1 & 1 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 & 1 & 2 \\ 0 & 0 & 1 & -2 & 0 & 1 \end{array} \right)$$

5.

$\frac{2_1 \quad 2_2 \quad 2_3}{\text{无解}}$ 相关

$2_2 \quad 2_3 \quad 2_4$ 无解 A

b.

$2_1 \quad 2_2 \quad 2_3 \quad 2_4$ 无解

C

7. D