

12 月 6 日课堂练习参考答案

1. -24

$$2. \begin{pmatrix} 2 & 0 & -\frac{1}{2} \\ -1 & 1 & 0 \\ 0 & -1 & \frac{1}{2} \end{pmatrix}$$

$$3. \begin{pmatrix} 2 \\ -1 \\ 0 \\ 0 \end{pmatrix} + c_1 \begin{pmatrix} -\frac{1}{2} \\ \frac{3}{2} \\ 1 \\ 0 \end{pmatrix} + c_2 \begin{pmatrix} 2 \\ -1 \\ 0 \\ 1 \end{pmatrix}$$

4. 向量组的秩是 3, $\alpha_1, \alpha_2, \alpha_4$ 构成一个极大无关组, $\alpha_3 = -\alpha_1 + 2\alpha_2$, $\alpha_5 = -\alpha_1 + \alpha_4$ 。

$$5. Q = \begin{pmatrix} -\frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{6}} & \frac{1}{\sqrt{3}} \\ \frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{6}} & \frac{1}{\sqrt{3}} \\ 0 & \frac{2}{\sqrt{6}} & \frac{1}{\sqrt{3}} \end{pmatrix} \text{ 是正交矩阵, 且 } Q^{-1}AQ = \begin{pmatrix} 0 & & \\ & 0 & \\ & & 3 \end{pmatrix}$$

6. 证明略