

第3章 3 「行列の積の行列式」 第1回

解答

1. (1) 12

(2) 16

(3) 4

(4) 48

(5) 36

(6) 12

2. (1) $\frac{1}{3}$

(2) $\frac{1}{5}$

(3) $\frac{5}{3}$

(4) $\frac{3}{5}$

(5) $\frac{1}{15}$

(6) $\frac{25}{3}$

解説

1. (1) $|BA| = |B||A| = 4 \times 3 = 12$

(3) $|{}^tB| = |B| = 4$

(5) $|A^2B| = |A|^2|B| = 3^2 \times 4 = 36$

2. (1) $|A^{-1}| = \frac{1}{|A|} = \frac{1}{3}$

(3) $|A^{-1}B| = |A^{-1}||B| = \frac{1}{|A|} \times |B| = \frac{5}{3}$

(5) $|A^{-1}B^{-1}| = |A^{-1}||B^{-1}| = \frac{1}{|A|} \times \frac{1}{|B|} = \frac{1}{15}$

(2) $|B^2| = |BB| = |B||B| = |B|^2 = 4^2 = 16$

(4) $|BAB| = |B||A||B| = 4 \times 3 \times 4 = 48$

(6) $|A{}^tB| = |A||{}^tB| = |A||B| = 3 \times 4 = 12$

(2) $|B^{-1}| = \frac{1}{|B|} = \frac{1}{5}$

(4) $|AB^{-1}| = |A||B^{-1}| = |A| \times \frac{1}{|B|} = \frac{3}{5}$

(6) $|BA^{-1}B| = |B||A^{-1}||B| = |B| \times \frac{1}{|A|} \times |B| = \frac{25}{3}$