
Exercise 1 True or False? If False, you should come up with a counterexample.

Suppose A and B are $n \times n$ matrices ($n \geq 2$).

1. $\det(AB) = \det A \det B$

Multiple Choice:

- (i) True
- (ii) False

2. If $\det A = \frac{1}{\det B}$, then $A = B^{-1}$.

Multiple Choice:

- (i) True
- (ii) False

3. $\det(A + B) = \det A + \det B$.

Multiple Choice:

- (i) True
- (ii) False

4. If $A = 2B$, then $\det A = 2 \det B$.

Multiple Choice:

- (i) True
- (ii) False

5. If $A = -B$, then $\det A = -\det B$ when n is odd, and $\det A = \det B$ when n is even.

Multiple Choice:

- (i) True
- (ii) False