

Questions of the Mathematics Examination

1. Linear Algebra

Given that $\det A = -1$. Find the value of $\det A^2$, $\det (-A)$ and $\det (0.5A)$ and $\det A^{-1}$.

2. Calculus

$$f(x) = \frac{\sin x}{x}$$

(a) Find the derivative of $f(x)$ or $f'(x)$.

(b) Solve $\lim_{x \rightarrow 0} = f'(x)$.