

Short Exam Proposal

1. Solve the equation $x^2 + 2x + 2 = 0$.
2. Calculate all (9) second order partial derivatives of $F(x, y, z) = x + y + xy \sin z$.
3. Calculate integral $\int x \sin(x^2) \, dx$.
4. Calculate integral $\int x \ln x \, dx$.
5. Calculate divergence of position vector $\vec{r}$ (in 3dim space using Cartesian coordinates).
6. Multiply matrices $\begin{pmatrix} 1 & 2 \\ 2 & 1 \end{pmatrix}$ and $\begin{pmatrix} 3 & 4 \\ 4 & 1 \end{pmatrix}$ and calculate determinant of the result.
7. Calculate eigenvalues and to unity normed eigenvectors of matrix $\begin{pmatrix} 1 & 2 \\ 2 & 1 \end{pmatrix}$.