**King Saud University Department of Mathematics Math-254**
**Second Semester Second Short Exam 1444H**
**Time Allowed: 35 Mins. Group No. 82438 Max Marks=10**

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**Name of the Student:**——————— **ID. No.** ———————-

**Questions:** (3+2+5)

Consider the linear system $Ax = b$ with $A = \begin{bmatrix} 3 & \frac{1}{2} \\ -5 & 4 \end{bmatrix}$ and $b = \begin{bmatrix} -29 \\ 0 \end{bmatrix}$

**(1)** Find inverse of $A$ by Simple Gauss-Elimination and use it to find solution of the linear system.

**(2)** Find determinant of matrix A by Doolittle's method.

**(3)** Find $x^{(1)}$ using the matrix form of Jacobi's iterative method starting with $x^{(0)} = [-\frac{17}{2}, -\frac{19}{2}]^T$. Hence, find the relative error bound of the error of approximation using $l_\infty$ norm in terms of residual vector and condition number of the given system.

—- Good Luck —-

**Start your solutions from here ....**