Assignment 2

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Class : SY Comp Div 2
Batch : S5

SOURCE CODE

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\documentclass{article}
\title{College of Engineering, Pune}
\author{Linear Algebra and Univariate Calculus}
\date{19/12/2022}
\usepackage{amsmath}
\begin{document}
\maketitle
1. Find the Rank and Nullity of following Matrix:
\begin{equation}
A=
\begin{pmatrix}
1 & -2 & -4 & 1\\
3 & 7  & 8 & 2\\
2 & 0 &  3 & 4\\
5 & 2 &  4 & 7\\
\end{pmatrix}
\end{equation}

2. Let A be a square matrix.\\ \\
\hspace*{1cm}(a) If $A^2 = 0$ show that I - A is
invertible. \\ \\
\hspace*{1cm}(b) If $A^3 = 0$ show that I - A is
invertible.\\ \\

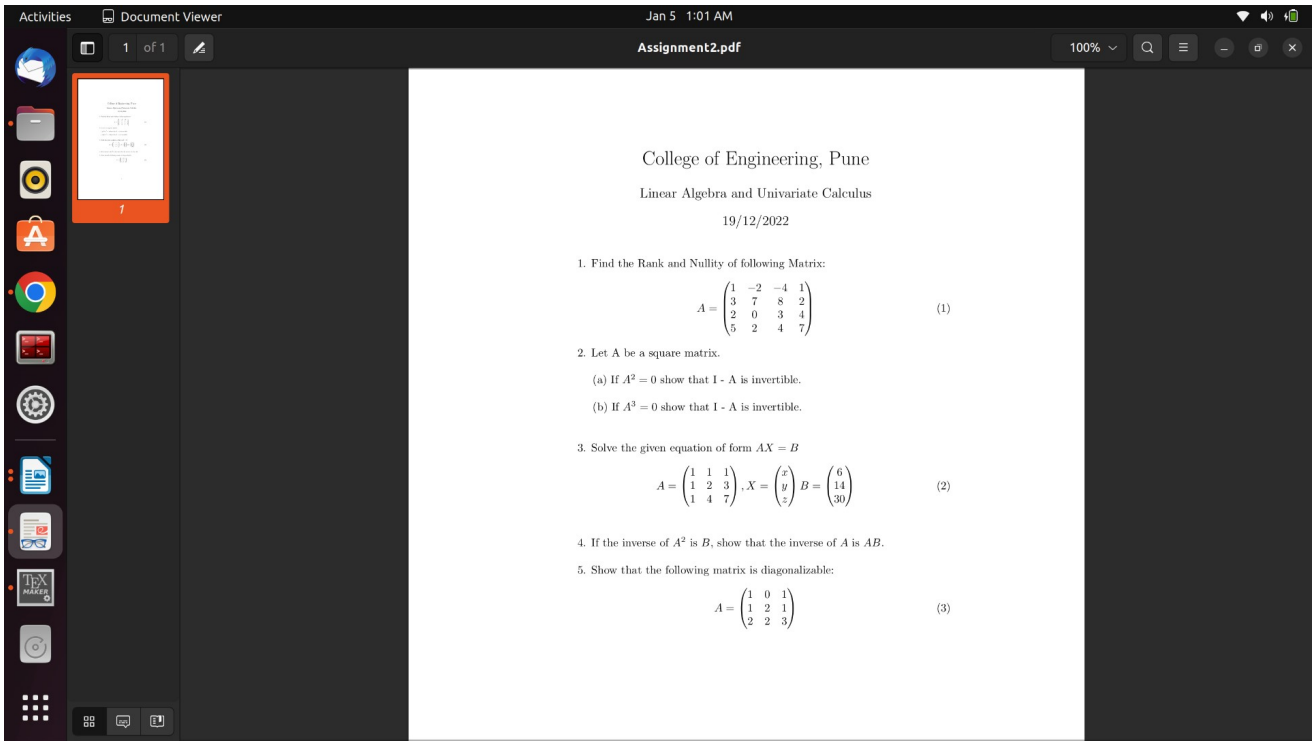
3. Solve the given equation of form $AX=B$
\begin{equation}
A=
```

```
\begin{pmatrix}
1 & 1 & 1\\
1 & 2 & 3\\
1 & 4 & 7\\
\end{pmatrix}
,
X=
\begin{pmatrix}
x\\
y\\
z\\
\end{pmatrix}
B=
\begin{pmatrix}
6\\
14\\
30\\
\end{pmatrix}
\end{equation}\\

4. If the inverse of $A^2$ is $B$, show that the
inverse of $A$ is $AB$.\\

5. Show that the following matrix is
diagonalizable: \\
\begin{equation}
A=
\begin{pmatrix}
1 & 0 & 1\\
1 & 2  & 1\\
2 & 2 &  3\\
\end{pmatrix}
\end{equation}
\end{document}
```

SCREENSHOTS



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