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```
\documentclass{beamer}
\usepackage[utf8]{inputenc}

\title{Assignment 2}
\author{shivangigupta }
\institute{Mata Sundri College}
\date{}
\usepackage{xcolor}
\usetheme{CambridgeUS}
\begin{document}
\begin{frame}
    Name:- Shivangi Gupta\\
    College Roll No.:- MAT/20/113\\
    University Roll No.:-20044563036\\


\end{frame}

\begin{frame}{Donald book eg 9.5}
\begin{block}
 {Part1}
\end{block}
 Let $\mathbf{x}=(x_1,\ldots,x_n)$,
    where the $x_i$ are nonnegative real numbers.
    Set
    \[
    M_r(\mathbf{x})=\left(\frac{x_1^r+x_2^r+\cdots+x_n^r}{n}\right)^{1/r},
    \; \; r \in \mathbf{R} \setminus \{0\},\]
    and
    \[ M_0(\mathbf{x})=\left(x_1 x_2 \ldots x_n \right)^{1/n}.\]
```

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31  We call $M_r(\mathbf{x})$ the \emph{$r$th power mean} of $\mathbf{x}$.
32
33  Claim:
34  \[\lim_{r\rightarrow 0} M_r(\mathbf{x})=M_0(\mathbf{x}),\]
35
36 \end{frame}
37 \begin{frame}{Donald book eg 9.5}
38 \begin{block}
39  {Part2}
40 \end{block}
41      Define\[V_n=\left[\begin{array}{ccccc}
42            1  & 1 &1&\ldots&1\\
43             x_1 &x_2 &x_30&\ldots&x_n\\
44            x_1^2 &x_2^2&x_3^2&\ldots&x_n^2\\
45            \vdots&  \vdots&  \vdots&\ddots&  \vdots& x_n^{n-1}
46        \end{array}\right].\]
47
48     We call $V_n$ the \emph{Vandermonde matrix} of order $n$.
49     Claim:
50     \[ \det V_n = \prod_{\leq i< j \leq n}(x_j_i).\]
51
52 \end{frame}
53
54
55 \begin{frame}{Question 4}
56
57
58
59
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\begin{itemize}

 \item \[3^3+4^3+5^3=6^3\]

  \item \[ \sqrt{100}=10\]
 \item \[ (a+b)^3=a^3+3a^2+3ab^2+b^3\]
  \item\[\sum_{k=1}^n k=\frac{n(n+1)}{2}\]

\end{itemize}
\end{frame}

\begin{frame}{Question 4 [part 2]}
\begin{itemize}



\item\[\frac{\pi}{4}=\frac{1}{1}-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\frac{1}{9}-\frac{1}{11}+\ldots\]\\
\item\[\cos\theta=\sin(90-\theta)\]\\
\item\[ e^{i0}=\cos\theta+i \sin\theta\]\\

\end{itemize}
\end{frame}

  \begin{frame}{Question 4 [part 3]}
  \begin{itemize}

 \item $$\lim_{\theta\rightarrow 0}\frac{\sin\theta}{\theta}=1$$ \\
\item$$\lim_{x\rightarrow \infty} \frac{\pi(x)}{x/ \log x}$$\\
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85  \item\[\int_{-\infty}^{\infty} e^{{-x}^2} d x =\sqrt{\pi}\]\\
86
87
88   \end{itemize}
89  \end{frame}
90
91  \begin{frame}{Question 5[Part 1]}
92  \begin{itemize}
93  \item Positive numbers a,b,c are the side lengths of a triangle if and only if a + b $>$ c,  b + c $>$ a and c + a $>$ b.
94  \item The area of triangle with side length a,b,c is given by HERON's FORMULA:\\
95   A=$\sqrt{s(s-a)(s-b)(s-c)}$\\
96  where s is semiperimeter$ (a+b+c)/2$.
97  .
98  \end{itemize}
99  \end{frame}
100
101
102  \begin{frame}{Question 5[Part 2]}
103  \begin{itemize}
104 \item The volume of regular tetrahedon of edge length 1 is$ \sqrt{2}/12$.
105  \item The quadritic equation $ax^2+bx+c=0 $ has root\\
106  \[r_1,r_2=\frac{-b\pm \sqrt{b^2-4 a c}}{2 a}\]
107  \item The derivative of a function f , denoted f',is defined by
108 \[ f'(x)=\lim_{h\rightarrow 0}\frac{f(x+h)-f(x)}{h}\]\\[0.3cm]
109
110  \end{itemize}
111   \end{frame}
112
113    \begin{frame}{Question 5[Part 3]}
```

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  \begin{itemize}
\item A real valued function $f$ is convex on an interval $I$ if\[ f(\lambda x+(1-\lambda)y)\leq \lambda f(x)+(1-\lambda)f(y),\] for  all $ x,y \in I$    and =$0\
\leq 1.$\\[0.3cm]
  \item The general solution to the differential equation\\
\centering y"-3y'+2y=0\\
\begin{flushleft}
is
\end{flushleft}
$ y=c_1 e^x+c_2e^{2x}$\\
\item The Fermat number $F_n$  is  defined lowing equations as $ F_n=2^{2^{n}},n\geq0.$\\


  \end{itemize}
  \end{frame}

   \begin{frame}{Question 6[Part1]}
   \begin{itemize}


    \item $ \frac{d}{dx}(\frac{x}{x+1})-\frac{1}{x+1^2}$\\[0.5cm]
 \item $\lim_{n\rightarrow \infty}({1+\frac{1}{n}}^n)$ \\[0.5cm]
\item  \(\begin{array}{cc}
   | a  &  d  |\\
   | c   & d|

  \end{array}\)= ad-bc\\[0.5cm]
     \item R_{\theta}=\(\left[ \begin{array}{ccc}
       \cos\theta    &  -\sin\theta\\
      \sin\theta    & \cos\theta
    \end{array}\right]\\\[0.5cm]
```

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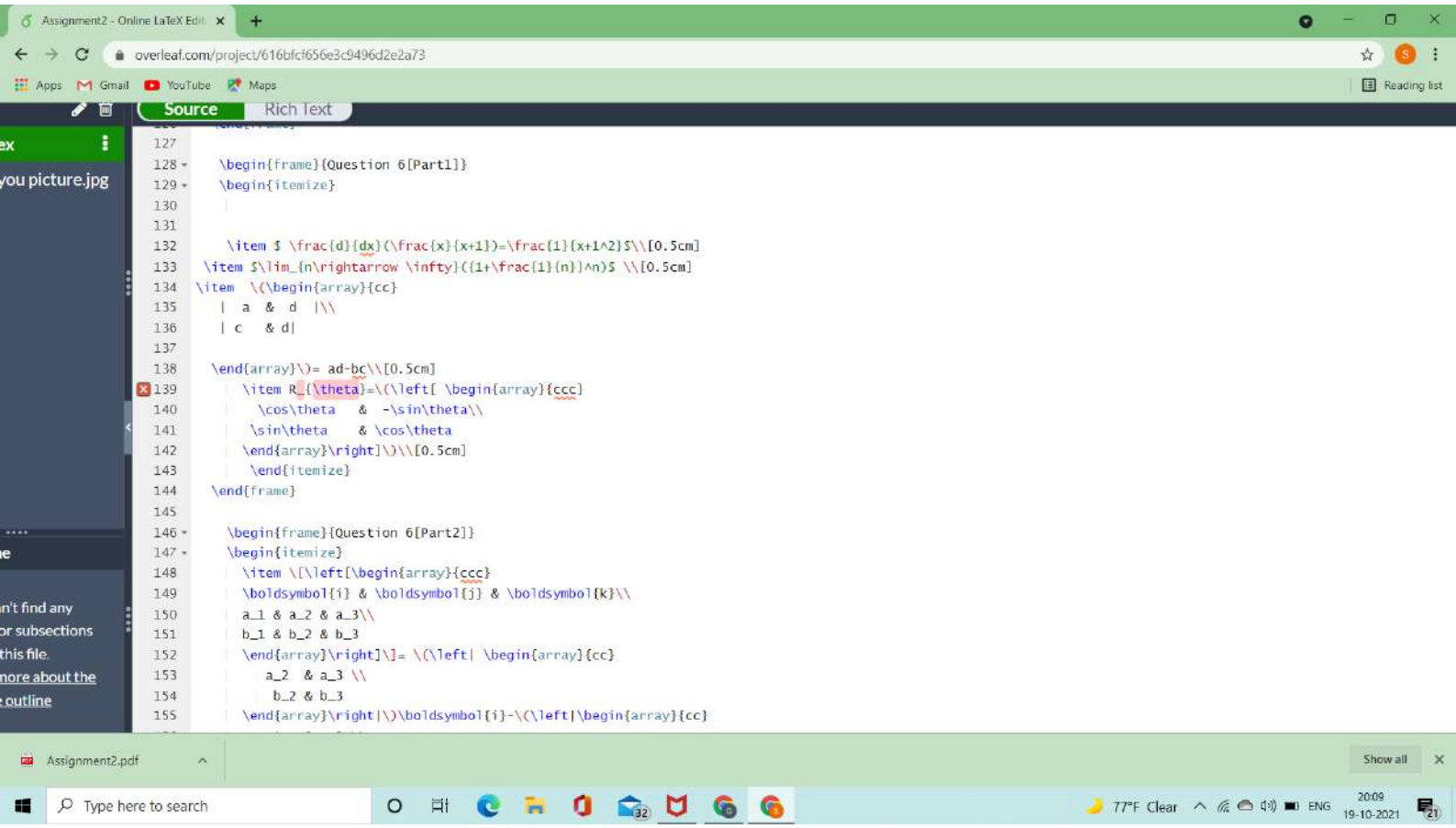
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127
128 \begin{frame}{Question 6[Part1]}
129 \begin{itemize}
130
131
132 \item $ \frac{d}{dx}(\frac{x}{x+1})=\frac{1}{x+1^2}$\\[0.5cm]
133 \item $\lim_{n\rightarrow \infty}({1+\frac{1}{n}}^n)$ \\[0.5cm]
134 \item \(\begin{array}{cc}
135 | a & d |\\
136 | c & d|
137
138 \end{array}\)= ad-bc\\[0.5cm]
139 \item R_{\theta}=\(\left[\begin{array}{ccc}
140 \cos\theta & -\sin\theta\\
141 \sin\theta & \cos\theta
142 \end{array}\right]\)\\[0.5cm]
143 \end{itemize}
144 \end{frame}
145
146 \begin{frame}{Question 6[Part2]}
147 \begin{itemize}
148 \item \[\left[\begin{array}{ccc}
149 \boldsymbol{i} & \boldsymbol{j} & \boldsymbol{k}\\
150 a_1 & a_2 & a_3\\
151 b_1 & b_2 & b_3
152 \end{array}\right]\]= \(\left| \begin{array}{cc}
153 a_2 & a_3 \\
154 b_2 & b_3
155 \end{array}\right|\)\boldsymbol{i}-\(\left|\begin{array}{cc}
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```
        b_2 & b_3
    \end{array}\right|\)\boldsymbol{i}-\(\left|\begin{array}{cc}
      a_1   & a_3 \\
        b_1&b_3 &
    \end{array}\right|\)\boldsymbol{j}+\(\left|\begin{array}{cc}
   a_1    &  a_2\\
     b_1  & b_2
    \end{array}\right|\)\boldsymbol{k}

   \item  \[\left[\begin{array}{cc}
      a_{11}   & a_{12} \\
      a_{21}  & a_{22}
    \end{array}\right] \left[\begin{array}{cc}
      b_{11}  & b_{12} \\
      b_{21}  & b_{22}
    \end{array}\right]=\left[\begin{array}{cc}
      a_{11}b_{11}+a_{12}b_{21} &  a_{11}b_{12}+a_{12}b_{22}\\
      a_{21}b_{11}+a_{22}b_{21}  & a_{21}b_{120}+a_{22}b_{22}
    \end{array}\right]\] \\
   \item  \[ f(x)=\left\{\begin{array}{ccc}
  -x^2 , & x\<0 \\
   x^2 , & 0\leqx\leq\\
   1,&x>2
\end{array}\right.\]
    \end{itemize}
 \end{frame}
   \begin{frame}
\frametitle{\centerline{Question-7 [part 1]}}
```

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\begin{eqnarray*}
    1+2&=&3\\
    4+5+6&=&7+8\\
    9+10+11+12&=&13+14+15\\
    16+17+18+19+19+20&=&13+14+15\\
    25+26+27+28+29+30&=&31+32+33+34+35
  \end{eqnarray*}

  \end{frame}


\begin{frame}
 \frametitle{question 7[Part2]}
 \begin{eqnarray*}
 (a+b)^2&=&(a+b)(a+b)\\
& =&(a+b)a+(a+b)b\\
& =&a(a+b)b(a+b)\\
& =&a^2+ab+ba+b^2\\
 & =&a^2+ab+ab+b^2\\
 & =&a^2+2ab+b^2
  \end{eqnarray*}
 \end{frame}
  \begin{frame}{Question 7[Part3}


\[\small \tan(\alpha+\beta+\gamma)\quad=\quad\frac{\tan(\alpha+\beta)+\tan\gamma}{1-\tan\alpha+\beta)+\tan\gamma}\]\\
\[=\quad\frac{\frac{tan\alpha+tan\beta}{1-tan\alpha tan\beta}+\tan\gamma}{1-(\frac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta})\tan\gamma}\]\\
\[=\quad\frac {\tan\alpha+\tan\beta + (1-\tan \alpha \tan\beta)\tan\gamma}{ 1-\tan\alpha\tan\beta-(\tan\alpha+\tan\beta)\tan\gamma}\]\\
\[=\quad\frac{\tan\alpha+\tan\beta+\tan\gamma-\tan\alpha \tan\beta \tan\gamma}{1-\tan\alpha \tan\beta-\tan\alpha\tan\gamma-\tan\beta\tan\gamma}\]
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\[\small \tan(\alpha+\beta+\gamma)\quad-\quad\frac{\tan(\alpha+\beta)+\tan\gamma}{1-\tan\alpha+\beta)+\tan\gamma}\]\\
\[=\quad\frac{\frac{tan\alpha+tan\beta}{1-tan\alpha tan\beta}+\tan\gamma}{1-(\frac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta})\tan\gamma}\]\\
\[=\quad\frac {\tan\alpha+\tan\beta + (1-\tan \alpha \tan\beta)\tan\gamma]{ 1-\tan\alpha\tan\beta-(\tan\alpha+\tan\beta)\tan\gamma}\]\\
\[=\quad\frac{\tan\alpha+\tan\beta+\tan\gamma-\tan\alpha \tan\beta \tan\gamma}{1-\tan\alpha \tan\beta-\tan\alpha\tan\gamma-\tan\beta\tan\gamma}\]

  \end{frame}

   \begin{frame}{Question 7}

  \[ \prod_p\left(1-\frac{1}{p^2}\right)=\prod_p\frac{1}{1+\frac{1}{p^2}+\frac{1}{p^4}+\ldots}\]
   \[={\left(\prod_p(1+\frac{1}{p^2}+\frac{1}{p^4}+\ldots)\right)}^{-1}\]\\
   \[={\left(1+\frac{1}{p^2}+\frac{1}{p^4}+\ldots\right)}^{-1}\]\\
   \[=\frac{6}{\pi^2}\]

 \end{frame}
 \begin{frame}
   \centering  \includegraphics[width=5cm,height=3cm]{thank-you picture.jpg}

 \end{frame}
\end{document}
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