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File outline

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```
1  \documentclass{beamer}
2  \usepackage[utf8]{inputenc}
3  \usetheme{Darmstadt}
4  \usepackage{xcolor}
5  \usepackage{graphicx}
6  \title{ASSIGNMENT - 2}
7  \institute{\large{\textcolor{green}{Mata Sundri College for Women}} \\\textcolor{blue}{University of Delhi}}
8  \author{\Large{\textcolor{red}{AMEEN} \\\textcolor{orange}{Roll no : MAT/20/123} \and \\\textcolor{yellow}{University Roll no : 20044563044}}}
9  \date{}
10 \begin{document}
11 \begin{frame}
12 \titlepage
13 \end{frame}
14 \begin{frame}{Content of Page 69}
15 1.Let x= $(x_1,\ldots,x_n)$, where the $x_i$ are non-negative real numbers. \\Set $$M_r(x)=\left(\frac{x_1^r+x_2^r+\cdots+x_n^r}{n}\right)^{1/r}, r
   \in R \backslash \{0\}, $$ and $$M_0(x)=(x_1x_2\ldots x_n)^{1/n}. $$
16 We call $M_r(x)$ \emph{rth power mean of x.} \\ \vspace{0.2in}
17 Claim : $$\lim_{r\rightarrow 0} M_r(x)=M_0(x). $$
18 \end{frame}
19 \begin{frame}{Content of Page 69}
20 2. Define
21 $$V_n=\left[\begin{array}{ccccc}
22 1&1&1&\ldots&1\\
23 x_1&x_2&x_3&\ldots&x_n\\
24 x_1^2&x_2^2&x_3^2&\ldots&x_n^2\\
25 \vdots&\vdots&\vdots&\ddots&\vdots\\
26 x_1^{n-1}&x_2^{n-1}&x_3^{n-1}&\ldots&x_n^{n-1}
27 \end{array}\right]$$
28 We call $V_n$ the \emph{Vandermonde matrix} of order \emph{n}.\\
29 Claim :
30
```

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```
30
31  $$\det V_n=\prod_{1\leq i<j\leq n}(x_j-x_i).$$
32  \end{frame}
33  \begin{frame}{Q4.Make the following equations}
34    \begin{itemize}
35       \item $$3^3+4^3+5^3=6^3$$
36      \item  $$\sqrt{100}=10$$
37      \item $$(a+b)^3=a^3+3a^2b+3ab^2+b^3$$
38      \item $$\sum^{n}_{k=1} k=\frac{n(n+1)}{2}$$
39      \item $$\frac{\pi}{4}=\frac{1}{1}-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\frac{1}{9}-\frac{1}{11}+\cdots$$
40    \end{itemize}
41  \end{frame}
42  \begin{frame}{Remaining parts of Q4}
43  \begin{itemize}
44      \item $$\cos\theta=\sin(90^{\circ} -\theta)$$
45      \item $$e^{i\theta}=\cos\theta + i\sin\theta$$
46      \item $$\lim_{\theta \rightarrow 0} \frac{\sin\theta}{\theta}=1$$
47      \item $$\lim_{x \rightarrow \infty} \frac{\pi(x)}{x/\log x}=1$$
48      \item $$\int^{\infty}_{-\infty} e^{-x^2} dx=\sqrt{\pi}$$
49  \end{itemize}
50  \end{frame}
51  \begin{frame}{Q5.Typeset the following sentences.}
52  \begin{itemize}
53      \item Positive numbers a,b, and c are the side lengths of a triangle if and only if $a+b > c,b+c >a$, and $c+a >b$.
54      \item The area of a triangle with side lengths \emph{a,b,c} is given by \emph{Heron's formula :}
55      $$A= \sqrt{s(s-a)(s-b)(s-c)}$$\\
56      where , \emph{s} is the semi-perimeter \emph{(a+b+c)/2}.
57      \item The volume of a regular tetrahedron of edge length 1 is $\sqrt{2}/12$.
58      \item The quadratic equation $ax^2 + bx + c = 0$ has roots\\ $$r_1,r_2=\frac{-b \pm\sqrt{b^2-4ac}}{2a}$$
59  \end{itemize}
    \end{frame}
```

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```
\end{frame}
\begin{frame}{Remaining parts of Q5}
    \begin{itemize}
    \item The \emph{derivative} of a function \emph{f} , denoted $f'$ , is defined by \\$$f'(x)=\lim_{h\rightarrow 0} \frac{f(x+h)-f(x)}{h}$$
    \item A real- valued function \emph{f} is \emph{convex} on interval \emph{I} if\\ $$f(\lambda x+(1-\lambda)y)\leq\lambda f(x)+(1-\lambda)f(y)$$,
    for all \emph{x,y} $\in$ \emph{I} and $0 \leq\lambda\leq1$.
    \item The general solution to the differential equation
    $$y"-3y'+2y=0$$
    is $$y=C_1 e^x+C_2 e^{2x}$$
    \item The \emph{Fermat number} $F_n$ is defined as
    $$F_n=2^{2^n}, n\geq0$$ .
\end{itemize}
\end{frame}
\begin{frame}{Q6. Make the following equations. Notice the large delimiters.}
 \begin{itemize}
    \item $$\frac{d}{dx}\left(\frac{x}{x+1}\right)=\frac{1}{(x+1)^2}$$
    \item $$\lim_{n\rightarrow \infty}\left(1+\frac{1}{n}\right)^n=e$$
    \item $$ \left|\begin{array}{cc}
    a&b\\
    c&d\end{array}\right|=ad-bc $$
    \item $$R_\theta =\left[\begin{array}{cc}
    \cos\theta&-\sin\theta\\
    \sin\theta&\cos\theta
    \end{array}\right]$$
 \end{itemize}
\end{frame}
\begin{frame}{Remaining parts of Q6}
\begin{itemize}
    \item $$ \left|\begin{array}{ccc}
    \textbf{i}&\textbf{j}&\textbf{k}\\
    a_1&a_2&a_3\\
```

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```
90      b_1&b_2&b_3
91      \end{array}\right|=\left|\begin{array}{cc}
92      a_2&a_3\\
93      b_2&b_3\end{array}\right|\textbf{i}-\left|\begin{array}{cc}
94      a_1&a_3\\
95      b_1&b_3\end{array}\right|\textbf{j}+\left|\begin{array}{cc}
96      a_1&a_2\\
97      b_1&b_2\end{array}\right|\textbf{k}$$
98      \item $$\left[\begin{array}{cc}
99      a_{11}&a_{12}\\
100     a_{21}&a_{22}\end{array}\right]\left[\begin{array}{cc}
101     b_{11}&b_{12}\\
102     b_{21}&b_{22}\end{array}\right]=\left[\begin{array}{lr}
103     a_{11}b_{11}+a_{12}b_{21}&a_{11}b_{12}+a_{12}b_{22}\\
104     a_{21}b_{11}+a_{22}b_{21}&a_{21}b_{12}+a_{22}b_{22}\end{array}\right]$$
105     \item $$f(x)=\left\{\begin{array}{lc}-x^2,& x<0\\
106     x^2,& 0\leq x\leq 2\\
107     4,&x >2\end{array}\right.$$
108  \end{itemize}
109 \end{frame}
110 \begin{frame}{Q7. Make the following multi-line equations.}
111 \begin{eqnarray*}
112 1+2&=&3\\
113 4+5+6&=&7+8\\
114 9+10+11+12&=&13+14+15\\
115 16+17+18+19+20&=&21+22+23+24\\
116 25+26+27+28+29+30&=&31+32+33+34+35
117 \end{eqnarray*}
118 \end{frame}
119 \begin{frame}{7.2}
    \begin{eqnarray*}
```

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```
\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}{7.3}
\begin{eqnarray*}
\tan(\alpha+\beta+\gamma)&=&\frac{\tan(\alpha+\beta)=\tan\gamma}{1-\tan(\alpha+\beta)\tan\gamma}\\
&=&\frac{\frac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta}+\tan\gamma}{1-\left(\frac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta}\right)\tan\gamma}
\\
&=&\frac{\tan\alpha+\tan\beta+(1-\tan\alpha\tan\beta)\tan\gamma}{1-\tan\alpha\tan\beta-(\tan\alpha+\tan\beta)\tan\gamma}\\
&=&\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{eqnarray*}
\end{frame}
\begin{frame}{7.4}
\begin{eqnarray*}
\prod_p\left(1-\frac{1}{p^2}\right)&=&\prod_p\frac{1}{1+\frac{1}{p^2}+\frac{1}{p^4}+\cdots}\\
&=&\left(\prod_p\left(1+\frac{1}{p^2}+\frac{1}{p^4}+\cdots\right)\right)^{-1}\\
&=&\left(1+\frac{1}{2^2}+\frac{1}{3^2}+\frac{1}{4^2}+\cdots\right)^{-1}\\
&=&\frac{6}{\pi^2}
\end{eqnarray*}
\end{frame}
\begin{frame}
\begin{center}
\includegraphics[scale=0.22]{R.jpg}
\end{center}
\end{frame}
```

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```
&=&(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}{7.3}
\begin{eqnarray*}
\tan(\alpha+\beta+\gamma)&=&\frac{\tan(\alpha+\beta)=\tan\gamma}{1-\tan(\alpha+\beta)\tan\gamma}\\
&=&\frac{\frac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta}+\tan\gamma}{1-\left(\frac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta}\right)\tan\gamma}
\\
&=&\frac{\tan\alpha+\tan\beta+(1-\tan\alpha\tan\beta)\tan\gamma}{1-\tan\alpha\tan\beta-(\tan\alpha+\tan\beta)\tan\gamma}\\
&=&\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{eqnarray*}
\end{frame}
\begin{frame}{7.4}
\begin{eqnarray*}
\prod_p\left(1-\frac{1}{p^2}\right)&=&\prod_p\frac{1}{1+\frac{1}{p^2}+\frac{1}{p^4}+\cdots}\\
&=&\left(\prod_p\left(1+\frac{1}{p^2}+\frac{1}{p^4}+\cdots\right)\right)^{-1}\\
&=&\left(1+\frac{1}{2^2}+\frac{1}{3^2}+\frac{1}{4^2}+\cdots\right)^{-1}\\
&=&\frac{6}{\pi^2}
\end{eqnarray*}
\end{frame}
\begin{frame}
\begin{center}
\includegraphics[scale=0.22]{R.jpg}
\end{center}
\end{frame}
\end{document}
```

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