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File outline

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```
1 \documentclass[xcolor=dvipsnames]{beamer}
2 \usepackage[utf8]{inputenc}
3 \usepackage{mathtools}
4 \usepackage{xcolor}
5 \usepackage{nopageno}
6 \definecolor{UBCblue}{rgb}{0.4706, 0.13725, 0.26667}
7 \usecolortheme[named=UBCblue]{structure}
8 \setheme{Madrid}
9 \useoutertheme{miniframes}
10 \useinnertheme{circles}
11 \usepackage{graphicx}
12 \setbeamertheme{background}{\includegraphics[width=\paperwidth,height=\paperheight]{bg.jpg}}
13 \title{\huge {\emph {Mata Sundri College for Women, \\\ University of Delhi}}}
14 \institute{\Large {\emph{\textcolor{blue}{College Roll No.- MAT/20/17\\ \vspace{0.1cm}
15 University Roll No.- 20044563007}}}}
16 \author{\huge {\emph{\textcolor{red}{Yukti Aggarwa}}}}
17 \date{}
18 \begin{document}
19 \maketitle
20 \thispagestyle{empty}
21
22 \begin{frame}{\emph{\textcolor{yellow}{Content of Page No. 69}}}
23 \begin{block}{}
24 \begin{itemize}
25 \item Let  $\text{tf}{x}=(x_1,\dots,x_n)$ , where the  $x_i$ s are non-negative real numbers. Set
26  $M_r(\text{tf}{x}) = \left(\frac{x_1^r+x_2^r+\dots+x_n^r}{n}\right)^{1/r}$ ,  $r \in \mathbb{R}\setminus\{0\}$ 
27 and
28  $M_0(\text{tf}{x}) = (x_1x_2\dots x_n)^{1/n}$ 
29 We call  $M_r(\text{tf}{x})$  the  $r$ th power mean of  $\text{tf}{x}$ .
30 \vspace{0.2cm}Claim: \vspace{0.2cm}
31  $\lim_{r \rightarrow 0} M_r(\text{tf}{x}) = M_0(\text{tf}{x})$ .
32 \end{itemize}
33 \end{block}
34 \end{frame}
35
36 \begin{frame}
```

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```
35
36 \begin{frame}
37 \begin{block}{}
38
39
40 \begin{itemize}
41 \item Define
42   $$V_n =
43   \left[\begin{array}{cccc}
44   1 & 1 & 1 & \dots & 1 \\
45   x_1 & x_2 & x_3 & \dots & x_n \\
46   x_1^2 & x_2^2 & x_3^2 & \dots & x_n^2 \\
47   \vdots & \vdots & \vdots & \ddots & \vdots \\
48   x_1^{n-1} & x_2^{n-1} & x_3^{n-1} & \dots & x_n^{n-1}
49 \end{array}\right]$$
50 \\[0.25cm]
51 We call  $V_n$  the Vandermonde matrix of order  $n$ . \\
52 \vspace{0.2cm}Claim:  $\vspace{0.3cm}$ 
53 
$$\det V_n = \prod_{1 \leq i < j \leq n} (x_j - x_i)$$

54 \end{itemize}
55 \end{block}
56 \end{frame}
57 \begin{frame}{\emph{\textcolor{yellow}{Question 4. Make the following equations}}}
58 \begin{block}{}
59 \begin{itemize}
60 \item  $3^3 + 4^3 + 5^3 = 6^3$ 
61 \end{itemize}
62 \end{block}
63 \begin{block}{}
64 \begin{itemize}
65 \item  $\sqrt{100} = 10$ 
66 \end{itemize}
67 \end{block}
68 \begin{block}{}
69 \begin{itemize}
70 \item  $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$ 

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```
69 \begin{itemize}
70 \item  $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$ 
71 \end{itemize}
72 \end{block}
73 \begin{block}{}
74 \begin{itemize}
75 \item  $\sum_{k=1}^n k = \frac{n(n+1)}{2}$ 
76 \end{itemize}
77 \end{block}
78 \end{frame}
79 \begin{frame}{\emph{\textcolor{yellow}{Remaining parts of Question 4}}}
80 \begin{block}{}
81 \begin{itemize}
82 \item  $\frac{\pi}{4} = \frac{1}{1} - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \dots$ 
83 \end{itemize}
84 \end{block}
85 \end{block}
86 \begin{block}{}
87 \begin{itemize}
88 \item  $\cos \theta = \sin (90^\circ - \theta)$ 
89 \end{itemize}
90 \end{block}
91 \end{block}
92 \begin{block}{}
93 \begin{itemize}
94 \item  $e^{i\theta} = \cos \theta + i \sin \theta$ 
95 \end{itemize}
96 \end{block}
97 \end{block}
98 \begin{block}{}
99 \begin{itemize}
100 \item  $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$ 
101 \end{itemize}
102 \end{block}
103 \end{frame}
104 \begin{frame}{\emph{\textcolor{yellow}{Remaining parts of Question 4}}}
```

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```
103 \end{frame}
104 \begin{frame}{\emph{\textcolor{yellow}{Remaining parts of Question 4}}}
105 \begin{block}{}
106 \begin{itemize}
107 | \item  $\lim_{\theta \rightarrow \infty} \frac{\pi(x)}{x \log x} = 1$  [0.2cm]
108 \end{itemize}
109 \end{block}
110 \begin{block}{}
111 \begin{itemize}
112 | \item  $\int_{-\infty}^{\infty} e^{-x^2} dx = \sqrt{\pi}$  [0.2cm]
113 \end{itemize}
114 \end{block}
115 \end{frame}
116 \begin{frame}{\emph{\textcolor{yellow}{Question 5. Typeset the following sentences}}}
117 \begin{block}{}
118 \begin{itemize}
119 | \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  $c + a > b$ . [0.2cm]
120 \end{itemize}
121 \end{block}
122 \begin{block}{}
123 \begin{itemize}
124 | \item The area of a triangle with side lengths  $a$ ,  $b$ ,  $c$  is given by Heron's formula:
125 | \vspace{0.2cm}
126 |  $A = \sqrt{s(s-a)(s-b)(s-c)}$ 
127 | where  $s$  is the semiperimeter  $(a+b+c)/2$ . [0.2cm]
128 \end{itemize}
129 \end{block}
130 \begin{block}{}
131 \begin{itemize}
132 | \item The volume of a regular tetrahedron of edge length 1 is  $\sqrt{2}/12$ . [0.2cm]
133 \end{itemize}
134 \end{block}
135 \end{frame}
136 \begin{frame}{\emph{\textcolor{yellow}{Remaining parts of Question 5}}}
137 \begin{block}{}
138 \begin{itemize}
```

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```
136 \begin{frame}{\emph{\textcolor{yellow}{Remaining parts of Question 5}}}  
137 \begin{block}{}  
138 \begin{itemize}  
139 \item The quadratic equation  $ax^2+bx+c=0$  has roots  
140  $r_1, r_2 = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$   
141 \end{itemize}  
142 \end{block}  
143 \begin{block}{}  
144 \begin{itemize}  
145 \item The \emph{derivative} of a function \emph{f}, denoted \emph{f'}, is defined by  
146  $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h)-f(x)}{h}$   
147 \end{itemize}  
148 \end{block}  
149 \end{frame}  
150 \begin{frame}{\emph{\textcolor{yellow}{Remaining parts of Question 5}}}  
151 \begin{block}{}  
152 \begin{itemize}  
153 \item A real-valued function \emph{f} is \emph{convex} on an interval \emph{I} if  
154  $f(\lambda x + (1-\lambda)y) \leq \lambda f(x) + (1-\lambda)f(y)$ ,  
155 for all  $x, y \in I$  and  $0 \leq \lambda \leq 1$ .  
156 \end{itemize}  
157 \end{block}  
158 \begin{block}{}  
159 \begin{itemize}  
160 \item The general solution to the differential equation  
161  $y'' - 3y' + 2y = 0$   
162 is  
163  $y = C_1 e^{\lambda x} + C_2 e^{2x}$   
164 \end{itemize}  
165 \end{block}  
166 \end{frame}  
167 \begin{frame}{\emph{\textcolor{yellow}{Remaining parts of Question 5}}}  
168 \begin{block}{}  
169 \begin{itemize}  
170 \item The \emph{Fermat number}  $F_n$  is defined as  
171
```


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```
169 \begin{block}{}
170 \begin{itemize}
171 \item The \emph{Fermat number}  $F_n$  is defined as
172  $F_n = 2^{2^{2^n}}$ ,  $\quad n \geq 0$ . $\end{itemize}$ 
173 \end{itemize}
174 \end{block}
175 \end{frame}
176 \begin{frame}{\emph{\textcolor{yellow}{Question 6. Make the following equations. Notice the large delimiters.}}}
177 \begin{block}{}
178 \begin{itemize}
179 \item  $\frac{d}{dx} \left( \frac{x}{x+1} \right) = \frac{1}{(x+1)^2}$ 
180 \end{itemize}
181 \end{block}
182 \begin{block}{}
183 \begin{itemize}
184 \item  $\lim_{n \rightarrow \infty} \left( 1 + \frac{1}{n} \right)^n = e$ 
185 \end{itemize}
186 \end{block}
187 \begin{block}{}
188 \begin{itemize}
189 \item  $\left| \begin{array}{cc} a & b \\ c & d \end{array} \right|$ 
190  $= ad - bc$ 
191 \end{itemize}
192 \end{block}
193 \end{block}
194 \end{frame}
195 \begin{frame}{\emph{\textcolor{yellow}{Remaining parts of Question 6}}}
196 \begin{block}{}
197 \begin{itemize}
198 \item  $R_{\theta} = \begin{array}{cc} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{array}$ 
199 \end{itemize}
200 \end{block}
201 \end{frame}
```

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203 | \end{array}\right]$$\[0.2cm]
204 | \end{itemize}
205 | \end{block}
206 | \begin{block}{}
207 | \begin{itemize}
208 | | \item $$\left[\begin{array}{ccc}
209 | | \textbf{i} & \textbf{j} & \textbf{k} \\
210 | | a_1 & a_2 & a_3 \\
211 | | b_1 & b_2 & b_3 \\
212 | \end{array}\right] = \left[\begin{array}{cc}
213 | | a_2 & a_3 \\
214 | | b_2 & b_3 \\
215 | \end{array}\right] \textbf{i} - \left[\begin{array}{cc}
216 | | a_1 & a_3 \\
217 | | b_1 & b_3 \\
218 | \end{array}\right] \textbf{j} + \left[\begin{array}{cc}
219 | | a_1 & a_2 \\
220 | | b_1 & b_2 \\
221 | \end{array}\right] \textbf{k}$$\[0.2cm]
222 | \end{itemize}
223 | \end{block}
224 | \begin{block}{}
225 | \begin{itemize}
226 | | \item $$\left[\begin{array}{cc}
227 | | a_{11} & a_{12} \\
228 | | a_{21} & a_{22} \\
229 | \end{array}\right] \left[\begin{array}{cc}
230 | | b_{11} & b_{12} \\
231 | | b_{21} & b_{22} \\
232 | \end{array}\right] = \left[\begin{array}{cc}
233 | | a_{11}b_{11}+a_{12}b_{21} & a_{11}b_{12}+a_{12}b_{22} \\
234 | | a_{21}b_{11}+a_{22}b_{21} & a_{21}b_{12}+a_{22}b_{22} \\
235 | \end{array}\right]$$\[0.2cm]
236 | \end{itemize}
237 | \end{block}
238 | \end{frame}
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```
236 \end{itemize}
237 \end{block}
238 \end{frame}
239 \begin{frame}{\emph{\textcolor{yellow}{{Remaining parts of Question 6}}}}
240 \begin{block}{}
241 \begin{itemize}
242 | \item $$f(x) = \left\{\begin{array}{lr}
243 | -x^2, & x < 0 \\
244 | x^2, & 0 \leq x \leq 2 \\
245 | 4, & x > 2 \end{array}\right. \\
246 | \end{array}\right. \\
247
248 \end{itemize}
249 \end{block}
250 \end{frame}
251 \begin{frame}{\emph{\textcolor{yellow}{Question 7. {Make the following multi-line equations}}}}
252 \begin{block}{\Large{\emph{\underline{Part 1}}}}
253 % \begin{itemize}
254 | \begin{eqnarray*}
255 | 1 + 2 & = & 3 \\
256 | 4 + 5 + 6 & = & 7 + 8 \\
257 | 9 + 10 + 11 + 12 & = & 13 + 14 + 15 \\
258 | 16 + 17 + 18 + 19 + 20 & = & 21 + 22 + 23 + 24 \\
259 | 25 + 26 + 27 + 28 + 29 + 30 & = & 31 + 32 + 33 + 34 + 35 \\
260 | \end{eqnarray*}
261 | %\end{itemize}
262 \end{block}
263 \end{frame}
264 \begin{frame}{}
265 \begin{block}{\Large{\emph{\underline{Part 2}}}}
266 \begin{eqnarray*}
267 | (a + b)^2 & = & (a + b)(a + b) \\
268 | & = & (a + b)a + (a + b)b \\
269 | & = & a(a + b) + b(a + b) \\
270 | & = & a^2 + ab + ba + b^2 \\
271 | & = & a^2 + ab + ab + b^2 \end{eqnarray*}
```


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```
267 | (a + b)^2 &= & (a + b)(a + b) \\[0.3cm]
268 | &= & (a + b)a + (a + b)b \\[0.3cm]
269 | &= & a(a + b) + b(a + b) \\[0.3cm]
270 | &= & a^2 + ab + ba + b^2 \\[0.3cm]
271 | &= & a^2 + ab + ab + b^2 \\[0.3cm]
272 | &= & a^2 + 2ab + b^2 \\[0.3cm]
273 | \end{eqnarray*}
274 | \end{block}
275 | \end{frame}
276 | \begin{frame}{}
277 | \begin{block}{\Large{\emph{\underline{Part 3}}}}
278 | \begin{eqnarray*}
279 | | \tan(\alpha + \beta + \gamma) &= & \frac{\tan(\alpha + \beta) + \tan \gamma}{1 - \tan(\alpha + \beta)\tan \gamma} \\[0.3cm]
280 | | &= & \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} \\[0.3cm]
281 | | &= & \frac{\tan \alpha + \tan \beta + (1 - \tan \alpha \tan \beta)\tan \gamma}{1 - \tan \alpha \tan \beta - (\tan \alpha + \tan \beta)\tan \gamma} \\[0.3cm]
282 | | &= & \frac{\tan \alpha + \tan \beta + \tan \gamma - \tan \alpha \tan \beta \tan \gamma}{1 - \tan \alpha \tan \beta - \tan \alpha \tan \beta \tan \gamma - \tan \beta \tan \gamma} \\[0.3cm]
283 | | \end{eqnarray*}
284 | \end{block}
285 | \end{frame}
286 | \begin{frame}{}
287 | \begin{block}{\Large{\emph{\underline{Part 4}}}}
288 | \begin{eqnarray*}
289 | | \prod_{p} \left(1 - \frac{1}{p^2}\right) &= & \prod_{p} \frac{1}{1 + \frac{1}{p^2} + \frac{1}{p^4} + \dots} \\[0.3cm]
290 | | &= & \left(\prod_{p} \left(1 + \frac{1}{p^2} + \frac{1}{p^4} + \dots\right)\right)^{-1} \\[0.3cm]
291 | | &= & \left(1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots\right)^{-1} \\[0.3cm]
292 | | &= & \frac{6}{\pi^2} \\[0.3cm]
293 | | \end{eqnarray*}
294 | \end{block}
295 | \end{frame}
296 | \begin{frame}{}
297 | | \includegraphics[angle=5,width=12cm,height=7.5cm]{tyy.jpg}
298 | \end{frame}
299 | \end{document}
300 |
```