

```

1 \documentclass{beamer}
2 \usepackage[utf8]{inputenc}
3 \usepackage[most]{tcolorbox}
4 \usepackage{graphicx}
5 \usepackage{fancybox}
6 \usepackage{amsmath}
7 \usepackage{xcolor}
8 \usepackage{eso-pic}
9 \title{PRESENTATION}
10 \institute{MATA SUNDRI COLLEGE FOR
WOMEN\\UNIVERSITY OF DELHI}
11 \author{RADHA TIWARI\\
12 MAT/20/131\\
13 20044563054}
14 \date{}
15 \usetheme{Frankfurt}
16 \usecolortheme{default}
17 \setbeamertemplate{background}{\includegraphics
[width=\paperwidth,height=\paperheight]{bor.jpg}}
18 \begin{document}
19 \begin{frame}
20 \titlepage
21 \end{frame}
22 \begin{frame}{Donald book eg 9.5}
23 \begin{itemize}
24 \item
25 Let  $x=(x_1\ldots,x_n)$ , where the  $x_i$ 
are non negative real numbers. Set

$$M_r(x)=\left(\frac{x_1^r+x_2^r+\ldots+x_n^r}{n}\right)^{\frac{1}{r}}, r \in \mathbb{R}$$


$$\backslash\{0\},$$
 and

$$M_0(x)=\{(x_1x_2\ldots x_n)\}^{\frac{1}{n}}$$


$$\\$$

26 We call  $M_r(x)$  the rth power mean of
 $x.$ 

```

```

    $$ \\
26 We call  $M_r(x)$  \emph{the rth power mean of
    x.}\\
27 Claim:  $\lim_{r \to 0} M_r(x) = M_0(x)$ 
28  $M_r(x) = M_0(x)$ 
29 \end{itemize}
30 \end{frame}
31 \newpage
32 \begin{frame}{Donald book eg 9.5}
33 \begin{itemize}
34 \item
35 Define
36  $V_n = \begin{bmatrix} 1 & 1 & 1 & \dots & 1 \\ x_1 & x_2 & x_3 & \dots & x_n \\ \{x_1\}^2 & \{x_2\}^2 & \{x_3\}^2 & \dots & \{x_n\}^2 \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ \{x_1\}^{n-1} & \{x_2\}^{n-1} & \{x_3\}^{n-1} & \dots & \{x_n\}^{n-1} \end{bmatrix}$ 
42  $\end{bmatrix}$ 
43 We call  $V_n$  the \emph{Vandermonde}
    matrix of order n.
44
45 Claim :  $\det V_n = \prod_{1 \leq i < j \leq n} (x_j - x_i)$ 
46 \end{itemize}
47 \end{frame}
48
49
50 \begin{frame}{Question 4 Part 1}
51  $3^3 + 4^3 + 5^3 = 6^3$ 
52  $\sqrt{100} = 10$ 
53  $(a+b)^3 = a^3 + 3a^2b + 3a\{b\}^2 + \{b\}^3$ 
54  $\sum_{k=1}^n k = \frac{n(n+1)}{2}$ 
55  $\frac{\pi}{4} = \frac{1}{1} - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \dots$ 

```



```

54  $$\sum_{k=1}^n K=\frac{n(n+1)}{2}$$
55  $$\frac{\pi}{4}=\frac{1}{1}-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\frac{1}{9}-\frac{1}{11}+\dots$$
56  \end{frame}
57  \begin{frame}{Question 4 Part 2}
58      $$\cos{\theta}=\sin{(90^\circ-\theta)}$$
59      $$e^{i\theta}=\cos{\theta}+i\sin{\theta}$$
60      $$\lim_{\theta\to 0} \frac{\sin{\theta}}{\theta}=1$$
61      $$\lim_{x\to\infty} \frac{\pi(x)}{x/\log x}=1$$
62      $$\int_{-\infty}^{\infty} e^{\{-x\}^2} dx=\sqrt{\pi}$$
63  \end{frame}
64
65
66  \newpage
67  \begin{frame}{Question 5 Part 1}
68  \begin{itemize}
69      \item Positive numbers a,b and c are the side lengths of a triangle if and only is $a+b>c$, $b+c>a$, and $c+a>b$.
70  \end{itemize}
71  \begin{itemize}
72      \item The area of a triangle with side lengths a, b, c is given by \emph{Heron's} formula: $$A=\sqrt{s(s-a)(s-b)(s-c)},$$ where s is the semiperimeter $(a+b+c)/2.$
73  \end{itemize}
74  \begin{itemize}
75      \item This volume of a regular tetrahedron of edge length 1 is $\sqrt{2}/12.$
76  \end{itemize}
77  \begin{itemize}
78      \item The quadratic equation $ax^2+bx+c=0$ has roots $$r_1,r_2=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

```

```

82
83 ▾ \begin{frame}{Question 5 Part2}
84 ▾ \begin{itemize}
85     \item The derivative of a function
      f, denoted  $f'$ , is defined by
      
$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

86     \item A real valued function  $f$  is convex
      on an interval  $I$  if  $f(\lambda x + (1-\lambda)y) \leq \lambda f(x) + (1-\lambda)f(y)$ ,
87     or all  $x, y \in I$  and  $0 \leq \lambda \leq 1$ .
88 \end{itemize}
89 \end{frame}
90 ▾ \begin{frame}{Question 5 Part 3}
91 ▾ \begin{itemize}
92     \item The general solution to the
      differential equation  $y'' - 3y' + 2y = 0$ 
93
94     is  $y = C_1 e^x + C_2 e^{2x}$ .
95     \item The Fermat number  $F_n$  is
      defined as  $F_n = 2^{2^n} + 1, n \geq 0$ .
96 \end{itemize}
97
98
99 \end{frame}
100 ▾ \begin{frame}{Question 6 Part 1}
101     
$$\frac{d}{dx} \left( \frac{x}{x+1} \right) = \frac{1}{(x+1)^2}$$

102     
$$\lim_{n \rightarrow \infty} \left( 1 + \frac{1}{n} \right)^n = e$$

103     
$$\left| \right.$$

104 ▾ \begin{array}{cc}
105     | a & b \\
106     | c & d \end{array}

```

```

105     a& b \\
106     c& d\\
107 \end{array}
108 \right|=ad-bc$$
109 $$R_\theta=
110 \begin{bmatrix}
111 \cos{\theta} & -\sin{\theta} \\
112 \sin{\theta} & \cos{\theta}
113 \end{bmatrix}
114 $$
115 $$\left|
116 \begin{array}{ccc}
117 \textbf{i} & \textbf{j} & \textbf{k} \\
118 a_1 & a_2 & a_3 \\
119 b_1 & b_2 & b_3
120 \end{array}
121 \right|
122 =
123 \left|
124 \begin{array}{cc}
125 a_2 & a_3 \\
126 b_2 & b_3
127 \end{array}
128 \right| \textbf{i}
129 -
130 \left|
131 \begin{array}{cc}
132 a_1 & a_3 \\
133 b_1 & b_3
134 \end{array}
135 \right| \textbf{j}
136 +
137 \left|
138 \begin{array}{cc}
139 a_1 & a_2 \\
140 b_1 & b_2

```



```

145 \end{frame}
146 \begin{frame}{Question 6 Part 2}
147 $$\begin{bmatrix}
148 a_{11} & a_{12} \\
149 a_{21} & a_{22}
150 \end{bmatrix}
151 \begin{bmatrix}
152 b_{11} & b_{12} \\
153 b_{21} & b_{22}
154 \end{bmatrix}
155 =
156 \begin{bmatrix}
157 a_{11}b_{11} + a_{12}b_{21} & a_{11}b_{12} + a_{12}b_{22} \\
158 a_{21}b_{11} + a_{22}b_{21} & a_{21}b_{12} + a_{22}b_{22}
159 \end{bmatrix}$$
160 $$f(x)=
161 \left\{
162 \begin{array}{ccc}
163 x^2, & x < 0 \\
164 x^2, & 0 \leq x \leq 2 \\
165 4, & x > 2
166 \end{array}
167 \right.}$$
168
169 \end{frame}
170 \begin{frame}{Question 7 Part 1}
171 \[1 + 2 = 3\]
172 \[4 + 5 + 6 = 7 + 8\]
173 \[9 + 10 + 11 + 12 = 13 + 14 + 15\]
174 \[16 + 17 + 18 + 19 + 20 = 21 + 22 + 23 +
175 24\]
176 \[25 + 26 + 27 + 28 + 29 + 30 = 31 + 32 + 33
177 + 34 + 35\]
178 \end{frame}
179 \begin{frame}{Question 7 Part 2}
180 \begin{align*}

```

```

178 \begin{align*}
179 (a+b)^2 \quad &= \quad (a+b)(a+b) \\
180 &= \quad (a+b)a + (a+b)b \\
181 &= \quad a(a+b) + (a+b)b \\
182 &= \quad a^2+ab + \underline{ba} + b^2 \\
183 &= \quad a^2+ab + ab + b^2 \\
184 &= \quad a^2+ 2ab + b^2 \\
185 \end{align*}
186 \end{frame}
187 \begin{frame}{Question 7 Part 3}
188 \begin{eqnarray*}
189 \tan(\alpha+\beta+\gamma) &= & \frac{\tan(\alpha+\beta)+\tan\gamma}{1-\tan(\alpha+\beta)\tan\gamma} \\
190 &= & \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} \\
191 &= & \frac{\tan\alpha+\tan\beta+(1-\tan\alpha\tan\beta)\tan\gamma}{1-\tan\alpha\tan\beta-(\tan\alpha+\tan\beta)\tan\gamma} \\
192 &= & \frac{\tan\alpha+\tan\beta+\tan\gamma-\tan\alpha\tan\beta\tan\gamma}{1-\tan\alpha\tan\beta-\tan\alpha\tan\beta\tan\gamma} \\
193 \end{eqnarray*}
194 \end{frame}
195 \begin{frame}{Question 7 Part 4}
196 \begin{eqnarray*}
197 \prod_p \left(1-\frac{1}{p^2}\right) &= & \prod_p \frac{1}{1+\frac{1}{p^2}+\frac{1}{p^4}+\dots} \\
198 &= & \left(\prod_p \left(1+\frac{1}{p^2}+\frac{1}{p^4}+\dots\right)\right)^{-1} \\
199 &= & \left(1+\frac{1}{2^2}+\frac{1}{3^2}+\frac{1}{4^2}+\dots\right)^{-1} \\
200 &= & \frac{6}{\pi^2}

```



```

alpha\tan\beta)+\tan\gamma}{1-\left(\frac{\t
an\alpha+\tan\beta}{1-\tan\alpha\tan\beta}\r
ight)\tan\gamma}\\\\
191 &=&\frac{\tan\alpha+\tan\beta+
(1-\tan\alpha\tan\beta)\tan\gamma}{1-\tan\alph
a\tan\beta-(\tan\alpha+\tan\beta)\tan\gamma}\\\\
192 &=&\frac{\tan\alpha+\tan\beta+\tan\gamma-\tan\
alpha\tan\beta\tan\gamma}{1-\tan\alpha\tan\bet
a-\tan\alpha\tan\gamma-\tan\beta\tan\gamma}\\\\

193 \end{eqnarray*}
194 \end{frame}
195 \begin{frame}{Question 7 Part 4}
196 \begin{eqnarray*}
197 \prod_p\left(1-\frac{1}{p^2}\right)&=&\prod
_p\frac{1}{1+\frac{1}{p^2}+\frac{1}{p^4}+\hdo
ts}\\\\
198 &=&\left(\prod_p\left(1+\frac{1}{p^2}+\fr
ac{1}{p^4}+\hdots\right)\right)^{-1}\\\\
199 &=&\left(1+\frac{1}{2^2}+\frac{1}{3^2}+\f
rac{1}{4^2}+\hdots\right)^{-1}\\\\
200 &=&\frac{6}{\pi^2}
201
202 \end{eqnarray*}
203 \end{frame}
204 \begin{frame}
205 \includegraphics[width=\paperwidth,height=\pap
erheight]{WhatsApp Image 2021-10-16 at
07.19.18 (2).jpeg}
206
207 \end{frame}
208
209 \end{document}
210

```