

Source

Rich Text

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1 \documentclass{beamer}
2 \usepackage[utf8]{inputenc}
3 \usepackage{graphicx}
4 \usepackage{xcolor}
5 \setbeamertemplate{background}{\includegraphics[width=\paperwidth,height=\paperheight]{bg1.png}}
6 \usetheme{AnnArbor}
7 \title{\textbf{ASSIGNMENT 2}}
8 \author{\texttt{CHESHTA}\and\hspace{2in} \textcolor{blue}{MAT/20/92}\and\hspace{2in}}
9 \textcolor{blue}{20044563015}}
10 \date{}
11 \begin{document}
12 \begin{frame}
13 \begin{minipage}{0.13\linewidth}
14 \includegraphics[width=2cm,height=2cm]{msc.png}
15 \end{minipage}\hfill
16 \begin{minipage}{0.7\linewidth}
17 \centering\bfseries MATA SUNDRI COLLEGE FOR WOMEN\\
18 (UNIVERSITY OF DELHI)
19 \end{minipage}\hfill
20 \begin{minipage}{0.13\linewidth}
21 \includegraphics[width=2cm,height=2cm]{du.png}
22 \end{minipage}
23 \Huge\titlepage
24 \end{frame}
25 \begin{frame}{Table of Contents}
26 \begin{center}
27 \LARGE\begin{tabular}{|c|c|}
28 \hline
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29 \textcolor{blue}{\textbf{Slide No.}}&\textcolor{blue}{\textbf{Content}}\\
30 \hline
31 \hline
32 3&Page 69 - Part 1\\
33 \hline
34 4&Page 69 - Part 2\\
35 \hline
36 5,6&Question 4\\
37 \hline
38 7-9&Question 5\\
39 \hline
40 10,11&Question 6\\
41 \hline
42 12-15&Question 7\\
43 \hline
44 \end{tabular}
45 \end{center}
46 \end{frame}
47 \begin{frame}{Page 69 - Part 1}
48 \textbf{1.} Let  $\mathbf{x}=(x_1, \dots, x_n)$ , where the  $x_i$  are non-negative real numbers. Set
49  $M_r(\mathbf{x})=\left(\frac{x_1^r+x_2^r+\dots+x_n^r}{n}\right)^{\frac{1}{r}}, r \in \mathbf{R} \setminus \{0\}$ ,
50 and  $M_0(\mathbf{x})=(x_1 x_2 \dots x_n)^{\frac{1}{n}}$ .
51 We call  $M_r(x)$  the rth power mean of  $\mathbf{x}$ .
52 Claim:  $\lim_{r \rightarrow 0} M_r(\mathbf{x})=M_0(\mathbf{x})$ .
53
54 \end{frame}
55 \begin{frame}{Page 69 - Part 2}
56 \textbf{2.} \; Define

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57 $$V_n=\left[\begin{array}{ccccc}
58 1&1&1&\cdots&1 \\
59 x_1&x_2&x_3&\cdots&x_n \\
60 x_1^2&x_2^2&x_3^2&\cdots&x_n^2 \\
61 \vdots&\vdots&\vdots&\ddots&\vdots \\
62 x_1^{n-1}&x_2^{n-1}&x_3^{n-1}&\cdots&x_n^{n-1} \\
63 \end{array}\right]$$
64 We call  $V_n$  the Vandermonde matrix of order  $n$ .
65 Claim:  $\det V_n = \prod_{1 \leq i < j \leq n} (x_j - x_i)$ 
66 \end{frame}
67 \begin{frame}{Question 4}
68 \begin{itemize}
69 \item  $3^3+4^3+5^3=6^3$ 
70 \item  $\sqrt{100}=10$ 
71 \item  $(a+b)^3=a^3+3a^2b+3ab^2+b^3$ 
72 \item  $\sum_{k=1}^n k = \frac{n(n+1)}{2}$ 
73 \item  $\frac{\pi}{4} = \frac{1}{1} - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \cdots$ 
74 \end{itemize}
75 \end{frame}
76 \begin{frame}
77 \begin{itemize}
78 \item  $\cos \theta = \sin(90^\circ - \theta)$ 
79 \item  $e^{i\theta} = \cos \theta + i \sin \theta$ 
80 \item  $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$ 
81 \item  $\lim_{x \rightarrow \infty} \frac{\pi(x)}{x \setminus \log x} = 1$ 
82 \item  $\int_{-\infty}^{\infty} e^{-x^2} dx = \sqrt{\pi}$ 
83 \end{itemize}
84 \end{frame}

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85 ▾ \begin{frame}{Question 5}
86 ▾ \begin{itemize}
87 \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  $c+a>b$ . \\
88 \vspace{0.2in}
89 \item The area of a triangle with side lengths  $a, b$  and  $c$  is given by \emph{Heron's formula}:
90  $A = \sqrt{s(s-a)(s-b)(s-c)}$ ,
91 where  $s$  is the semi perimeter  $\frac{a+b+c}{2}$  \\
92 \vspace{0.2in}
93 \item The volume of a regular tetrahedron of edge length 1 is  $\frac{\sqrt{2}}{12}$ .
94 \end{itemize}
95 \end{frame}
96 ▾ \begin{frame}
97 ▾ \begin{itemize}
98 \item The quadratic equation  $ax^2+bx+c=0$  has roots  $r_1, r_2 = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ 
99 \vspace{0.2in}
100 \item The \emph{derivative} of a function  $f$ , denoted  $f'$ , is defined by  $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h)-f(x)}{h}$ 
101 \vspace{0.2in}
102 \item A real-valued function  $f$  is \emph{convex} on an interval  $I$  if  $f(\lambda x + (1-\lambda)y) \leq f(x) + (1-\lambda)f(y)$ ,
103 for all  $x, y \in I$  and  $0 \leq \lambda \leq 1$ .
104 \end{itemize}
105 \end{frame}
106 ▾ \begin{frame}
107 ▾ \begin{itemize}
108 \item The general solution to the differential equation  $yy'' - 3y' + 2y = 0$  is  $y = C_1 e^x + C_2 e^{2x}$ 
109 \vspace{0.2in}
110 \item The \emph{Fermat number}  $F_n$  is defined as  $F_n = 2^{2^n}, n \geq 0$ .
111 \end{itemize}
112 \end{frame}

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113 - \begin{frame}{Question 6}
114 - \begin{itemize}
115 \item $$\frac{d}{dx}\left(\frac{x}{x+1}\right)=\frac{1}{(x+1)^2}$$
116 \item $$\lim_{n\rightarrow\infty}\left(1+\frac{1}{n}\right)^n=e$$
117 \item $$\left|\begin{array}{cc}
118 a&b\\
119 c&d
120 \end{array}\right|=ad-bc$$
121 \item $$R_{\theta}=\left[\begin{array}{cc}
122 \cos\theta&-\sin\theta\\
123 \sin\theta&\cos\theta
124 \end{array}\right]$$
125 \end{itemize}
126 \end{frame}
127 - \begin{frame}
128 - \begin{itemize}
129 \item $$\left|\begin{array}{ccc}
130 \textbf{i}&\textbf{j}&\textbf{k} \\
131 a_1&a_2&a_3 \\
132 b_1&b_2&b_3
133 \end{array}\right|=\left|\begin{array}{cc}
134 a_2&a_3 \\
135 b_2&b_3
136 \end{array}\right|\textbf{i}-\left|\begin{array}{cc}
137 a_1&a_3 \\
138 b_1&b_3
139 \end{array}\right|\textbf{j}+\left|\begin{array}{cc}
140 a_1&a_2

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141 b_1&b_2
142 \end{array}\right|\textbf{k}$$
143 \item $$\left[\begin{array}{cc}
144 a_{11}&a_{12} \\
145 a_{21}&a_{22}
146 \end{array}\right]\left[\begin{array}{cc}
147 b_{11}&b_{12} \\
148 b_{21}&b_{22}
149 \end{array}\right]=\left[\begin{array}{cc}
150 a_{11}b_{11}+a_{12}b_{21} & a_{11}b_{12}+a_{12}b_{22} \\
151 a_{21}b_{11}+a_{22}b_{21} & a_{21}b_{12}+a_{22}b_{22}
152 \end{array}\right]$$
153 \item $$f(x)=\left\{\begin{array}{c}
154 -x^2,&x<0 \\
155 x^2,&0\leq x\leq 2 \\
156 4,&x>2
157 \end{array}\right. $$
158 \end{itemize}
159 \end{frame}
160 \begin{frame}{Question 7- PART 1}
161 \begin{block}{}
162 \textbf{1.}
163 \begin{eqnarray*}
164 1+2=&3 \\
165 4+5+6=&7+8 \\
166 9+10+11+12=&13+14+15 \\
167 16+17+18+19+20=&21+22+23+24 \\
168 25+26+27+28+29+30=&31+32+33+34+35

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169 \end{eqnarray*}
170 \end{block}
171 \end{frame}
172 \begin{frame}{PART 2}
173 \begin{block}{}
174 \textbf{2.}
175 \begin{eqnarray*}
176 (a+b)^2&=&(a+b)(a+b)\\
177 &=&(a+b)a+(a+b)b\\
178 &=&a(a+b)+b(a+b)\\
179 &=&a^2+ab+ba+b^2\\
180 &=&a^2+ab+ab+b^2\\
181 &=&a^2+2ab+b^2
182 \end{eqnarray*}
183 \end{block}
184 \end{frame}
185 \begin{frame}{PART 3}
186 \begin{block}{}
187 \textbf{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\gamma-\tan\beta\tan\gamma} \\
193 \end{eqnarray*}
194 \end{block}
195 \end{frame}

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196 ▾ \begin{frame}{PART 4}
197 ▾ \begin{block}{}
198 \textbf{4.}
199 ▾ \begin{eqnarray*}
200 \prod_{p} \left(1 - \frac{1}{p^2}\right) &=& \prod_{p} \frac{1}{1 + \frac{1}{p^2} + \frac{1}{p^4} + \cdots} \\
201 &=& \left( \prod_{p} \left(1 + \frac{1}{p^2} + \frac{1}{p^4} + \cdots\right) \right)^{-1} \\
202 &=& \left(1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \cdots\right)^{-1} \\
203 &=& \frac{6}{\pi^2}
204 \end{eqnarray*}
205 \end{block}
206 \end{frame}
207 ▾ \begin{frame}
208 \includegraphics[width=12cm,height=8cm]{thank you.jpg}
209 \end{frame}
210 \end{document}

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