Assignment

Source | Rich Text

```
\documentclass{beamer}
\usepackage[utf8]{inputenc}
\usepackage{xcolor}
\title{NAME - SEJAL\\
COLLEGE ROLL NO. -  MAT/20/107\\}
\author{\textbf{UNIVERSITY ROLL NO. - 20044563035}}
\date{}
\institute{\textbf{MATA SUNDRI COLLEGE FOR WOMEN\\ (UNIVERSITY OF DELHI)}}
\usetheme{Berlin}
\usecolortheme{beaver}
\usepackage{graphicx}
\begin{document}
\maketitle
\section{}
\begin{frame}{Example 9.5}
\begin{itemize}
    \item Let $\mathbf{x}=(x_1, \ldots,x_n)$, where the $x_i$ are non-negative real numbers. Set
    \[M_r(\mathbf{x})= \left(\frac{x_1^r+\cdots+x_n^r}{n}\right)^{1/r}, \; \; r \in \mathbf{R}
    \setminus \{0\},\] and \[M_0(\mathbf{x})= \left(x_1 x_2 \ldots x_n \right)^{1/n}.\] We call
    $M_r(\mathbf{x})$ the \emph{$r$th power mean} of $\mathbf{x}$.\\
    Claim: \[\lim_{r\rightarrow 0} M_r(\mathbf{x})= M_0(\mathbf{x})\]
\end{itemize}
\end{frame}
\begin{frame}{Example 9.5}
\begin{itemize}
    \item Define \[V_n=\left[\begin{array}{ccccc}
  1 & 1 & 1 & \ldots & 1 \\
 x_1 & x_2 & x_3 & \ldots & 1 \\
 x_1^2 & x_2^2 & x_3^2 & \ldots & x_n^2 \\
 \vdots & \vdots & \vdots & \ddots & \vdots \\
 x_1^{n-1} & x_2^{n-1} & x_3^{n-1} & ldots & x_n^{n-1}
    \end{array}\right].\] We call $V_n$ the \emph{Vandermonde matrix} of order $n$.\\
    Claim: \[\det V_n = \prod_{1 \leq i < j \leq n}(x_j-x_i).\]
\end{itemize}
\end{frame}
\begin{frame}{Question 4. Make the following equations.}
\begin{itemize}
    \item $$3^3+4^3+5^3 = 6^3$$\\
    \item $$\sqrt{100} =  10$$\\
    \item $$(a+b)^3 = a^3+3a^2b+3ab^2+b^3$$\\
    \item\[\sum_{k=1}^{n} k = \frac{n(n+1)}{2}\]\\
    \item\[\frac{\pi}{4}=\frac{1}{1}-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\frac{1}{9}-\frac{1}{11}+\ld
    ots\]
\end{itemize}
\end{frame}
\begin{frame}
\begin{itemize}
    \item$$\cos\theta=\sin(90^o-\theta)$$\\
    \item$$e^{i\theta}=\cos\theta+i\sin\theta$$\\
    \item\[\lim_{\theta \rightarrow 0}\frac{\sin\theta}{\theta}=1\]\\
    \item\[\lim_{x \rightarrow \infty}\frac{\pi(x)}{x/\log x}=1\]\\
    \item\[\int_{-\infty}^{\infty} e^{-x^2}dx = \sqrt{x}\]
\end{itemize}
\end{frame}
```

```
\begin{frame}{Question 5. Typeset the following sentences.}
\begin{itemize}
\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 $c+a>b$.\\
   \item The area of 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 $a+b+c/2$.\\
   \item The volume of a regular tetrahedron of edge length 1 is $\sqrt{2}/12$.
   \item The quadratic equation $ax^2+bx+c=0$ has roots $$r_1,r_2=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$
\end{itemize}
\end{frame}
\begin{itemize}
    \item The derivative of a function f, denoted $f^\prime$, is defined by $$f^\prime(x)=\lim_{h \rightarrow 0}\frac{f(x+h)-f(x)}{h}.$$
    \item A real-valued function f is \emph{convex} on an interval \emph{I} if $$f(\lambda x + (1-\lambda)y)\leq\lambda f(x)+(1-\lambda)f(y),$$ for all $x, y\in$ \emph{I} and $0 \leq \lambda \leq 1.$
    \item The general solution to the differential equation \[y^{\prime\prime}-3y^\prime+2y=0\] is \[y=C_1e^x+C_2e^{2x}.\]
    \item The \emph{Fermat number} \(F_n\) is defined as \[F_n = 2^{2{n}}, n \leq 0.\]
\end{itemize}
\begin{frame}{Question 6. 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 \[\begin{vmatrix}
                a & b\\
                c & d\\
                \end{vmatrix} = ad-bc\]
         \item \[R_\theta =\left[\begin{array}{cc}
 \cos \theta & -\sin \theta \\
  \sin \theta & \cos \theta
         \end{array}\right]\]
    \end{itemize}
\end{frame}
\begin{frame}
\begin{itemize}
 \item\[\begin{vmatrix}
    i & j & k\\
    a_1 & a_2 & a_3\\
    b_1 & b_2 & b_3
    \end{vmatrix} = \begin{vmatrix}
    a_2 & a_3\\
    b_2 & b_3
    \end{vmatrix}i- \begin{vmatrix}
    a_1 & a_3\\
    b_1 & b_3
    \end{vmatrix}j+ \begin{vmatrix}
    a_1 & a_2\\
    b_1 & b_2
    \end{vmatrix}k\]\\
   \item\[\begin{bmatrix}
    a_{11} & a_{12}\\
    a_{21} & a_{22}
    \end{bmatrix}
    \begin{bmatrix}
    b_{11} & b_{12}\\
    b_{21} & b_{22}
    \end{bmatrix}=
    \begin{bmatrix}
    a_{11}b_{11} + a_{12}b_{21} & a_{11}b_{12} + a_{12}b_{22}\\
    a_{21}b_{11} + a_{22}b_{21} & a_{21}b_{12} + a_{22}b_{22}
    \end{bmatrix}\]\\
    \item\[f(x) = \begin{cases}-x^2 , x<0\\x^2 , 0\le x\le 2\\4 , x>2\end{cases}\]
\end{itemize}
\end{frame}
```

```
\end{frame}
\begin{frame}{Question 7. Make the following multi-line equations.}
\begin{block}{Part 1}
\begin{align*}
    1+2 \quad &= \quad 3\\
  4+5+6 \quad &= \quad 7+8\\
  9+10+11+12 \quad &= \quad 13+14+15\\
  16+17+18+19+20 \quad &= \quad 21+22+23+24\\
  25+26+27+28+29+30 \quad &= \quad 31+32+33+34+35
\end{align*}
\end{block}
\end{frame}
\begin{frame}{Question 7. Make the following multi-line equations.}
\begin{block}{Part 2}
\begin{align*}
    (a+b)^2 \quad &= \quad (a+b)(a+b)\\
    &= \quad (a+b)a + (a+b)b\\
    &= \quad a(a+b) + b(a+b)\\
    &= \quad a^2+ab+ba+b^2\\
    &= \quad a^2+ab+ab+b^2\\
    &= \quad a^2+2ab+b^2
\end{align*}
\end{block}
\end{frame}
\begin{frame}{Question 7. Make the following multi-line equations.}
\begin{block}{Part 3}
\begin{align*}
    \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-\left(\frac{\tan\
    alpha+\tan\beta}{1-\tan\alpha\tan\beta}\right)\tan\gamma}\\
    &= \quad \frac{\tan\alpha+\tan\beta+(1-\tan\alpha\tan\beta)\tan\gamma}{1-\tan\alpha\tan\beta-(\ta
    n\alpha+\tan\beta)\tan\gamma}\\
    &= \quad \frac{\tan\alpha+\tan\beta+\tan\gamma-\tan\alpha\tan\beta\tan\gamma}{1-\tan\alpha\tan\be
    ta-\tan\alpha\tan\gamma-\tan\beta\tan\gamma}
\end{align*}
\end{block}
\end{frame}
\begin{frame}{Question 7. Make the following multi-line equations.}
\begin{block}{Part 4}
\begin{align*}
    \prod_{p}\left(1-\frac{1}{p^2}\right) \quad &= \quad
    \prod_{p}\frac{1}{1+\frac{1}{p^2}+\frac{1}{p^4}+\cdots}\\
    &= \quad \left(\prod_p\left(1+\frac{1}{p^2}+\frac{1}{p^4}+\cdots\right)\right)^{-1}\\
    &= \quad \left(1+\frac{1}{2^2}+\frac{1}{3^2}+\frac{1}{4^2}+\cdots\right)^{-1}\\
    &= \quad \frac{6}{\pi^2}
\end{align*}
\end{block}
\end{frame}
\begin{frame}
    \includegraphics[width=11cm,height=8cm]{istockphoto.jpg}
\end{frame}
\end{document}
```