Chapter 9 (Donald & Erickson) | (1) WhatsApp | Meet - sxe-nkim-ebv | assignment - Online LaTeX Editor | Assignment 2

overleaf.com/project/615eb277b4d80e66e158dae2

Menu | assignment | Review | Share | Submit | History | Chat

Source | Rich Text

main.tex

Thank u slide.jpg

```
\documentclass[xcolor=dvipsnames]{beamer}
\usepackage[utf8]{inputenc}
\usepackage{xcolor}
\title{\textcolor{blue}{Assignment  2}}
\author{Anita\\
College Rollno. MAT/20/55\\University Roll no.  20044563008}
\institute{\large{Mata Sundri College for Women\\University of Delhi}}
\date{}
\usepackage{graphicx}
\usetheme{Madrid}
\definecolor{UBCblue}{rgb} {1,2}
\setbeamercolor{frametitle}{bg=green!40!black}
\usecolortheme[named=UBCblue]{structure}
\begin{document}
\frame{\titlepage}
\begin{frame}{Copy point 1 on page number 69}
\begin{block}{part-1}
\begin{itemize}
 \item Let $\mathbf{x}=(x_1,\ldots,x_n)$,
  where the $x_i$ are non-negative real numbers.
    Set
    \[
    M_r(\mathbf{x}) = \left(\frac{x_1^r+x_2^r
    +\cdots+x_n^r}{n}\right)^{1/r},
    \; \; r \in \mathbf{R} \setminus \{0\},
    \]
    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{block}
   \end{frame}
```

File outline

We can't find any sections or subsections in this file.

Find out more about the file outline

Type here to search | 74% | 21°C Polluted air 500 | ENG | 10:26 08-11-2021

Chapter 9 (Donald & Erickson) | (1) WhatsApp | Meet - sxe-nkim-ebv | assignment - Online LaTeX Editor | Assignment 2

overleaf.com/project/615eb277b4d80e66e158dae2

Menu | assignment | Review | Share | Submit | History | Chat

Source | Rich Text

main.tex

Thank u slide.jpg

```
  \begin{frame}{copy point 2 on page 69}
  \begin{block}{part-2}
  \begin{itemize}
 \item
   Define
   \[
   V_n=
   \left[
   \begin{array}{ccccc}
      1 & 1 & 1 & \ldots  &1  \\
      x_1 &x_2 & x_3 & \ldots & x_n\\
      x_1^2 & x_2^2 & x_3^2 & \ldots & x_n^2\\
      \vdots & \vdots & \vdots & \ddots & \vdots\\
      x_1^{n-1} & x_2^{n-1} & x_3^{n-1} & \ldots & x_n^{n-1}\\
   \end{array}
   \right] .
   \]
   We call $V_n$ the \emph{Vander monde matrix} of order $n$.

   Claim:
   \[
   \det V_n = \prod_{1 \leq i < j \leq n}(x_j-x_i).
   \]
\end{itemize}
\end{block}

\end{frame}

\begin{frame}{Questions 4}
 \begin{block}{4.1}
   $3^3+4^3+5^3 = 6^3$\\
   \end{block}
   \begin{block}{4.2}
   $\sqrt{100}=10$\\
    \end{block}
   \begin{block}{4.3}
   $(a+b)^3= a^3+b^3+3ab^2+3ba^2$\\
    \end{block}
\end{frame}
\begin{frame}{remaining parts of question 4}
```

File outline

We can't find any sections or subsections in this file.

Find out more about the file outline

Type here to search | 74% | 21°C Polluted air 500 | ENG | 10:27 08-11-2021

Chapter 9 (Donald & Erickson) | (1) WhatsApp | Meet - sxe-nkim-ebv | assignment - Online LaTeX Editor | Assignment 2

overleaf.com/project/615eb277b4d80e66e158dae2

Menu | assignment | Review | Share | Submit | History | Chat

Source | Rich Text

main.tex

Thank u slide.jpg

```
    \begin{block}{4.4}
    $\sum_{k=1}^{n}{\frac{n(n+1)}{2}}
    \label{sum}$\\
    \end{block}
     \begin{block}{4.5}
    $\frac{\pi}{4} = 1-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\frac{1}{9}-\frac{1}{11}+\cdots$\\
     \end{block}
    \begin{block}{4.6}
    $cos{\theta}=sin{(90^\circ-\theta)}$\\
     \end{block}
    \begin{block}{4.7}
    $e^{i\theta} = Cos(\theta)+i sin(\theta)$\\
     \end{block}
     \end{frame}
     \begin{frame}{remaining parts of question 4}
    \begin{block}{4.8}
    $\lim_{\theta \to 0}\frac{sin(\theta)}{\theta}=1`$\\
     \end{block}
    \begin{block}{4.9}
     $\lim_{x \to \infty }\frac{\pi\mathbf{(x)}}{x/\log{x}}=1$
     \end{block}
    \begin{block}{4.10}
    $\int_{-\infty}^{\infty}e^{-x^2}dx=\sqrt{\pi}
    \label{int}$
     \end{block}
\end{frame}

\begin{frame}{Question 5.}
\begin{block}{5.1}
    Positive numbers a,b and c are the side lengths of triangle if and only if a+b$ > $c, b+c $> $a, c+a $>$ b.\\
    \end{block}
    \begin{block}{5.2}
    The area of triangle with side length a , b , c is given by\emph{ Heoren's formula}:
    \begin{eqnarray*}
    A&=&\sqrt{(s)(s-a)(s-b)(s-c)},
    \end{eqnarray*} where s is the semiperemeter $\frac{a+b+c}{2}$.\\
    \end{block}
\end{frame}
\begin{frame}{remaining parts of questio 5}
\begin{block}{5.3}
```

File outline

We can't find any sections or subsections in this file.

Find out more about the file outline

Type here to search | 74% | 21°C Polluted air 500 | ENG | 10:27 08-11-2021

Chapter 9 (Donald & Erickson) | (1) WhatsApp | Meet - sxe-nkim-ebv | assignment - Online LaTeX Editor | Assignment 2

overleaf.com/project/615eb277b4d80e66e158dae2

Menu | assignment | Review | Share | Submit | History | Chat

Source | Rich Text

main.tex

Thank u slide.jpg

```
\begin{block}{5.3}
The volume of a rectangular tetrahedron of edge length 1 is$\frac{ \sqrt{2}}{12}$\\\end{block}
\begin{block}{5.4}
The quadratic equation $ax^2+bx+c=0$ has roots \\
\begin{eqnarray*}
r_1,r_2&=&\frac{-b\pm \sqrt{b^2 - 4ac}}{2a}.
\end{eqnarray*}
\end{block}
\end{frame}
\begin{frame}{ remaining parts of question 5}
\begin{block}{5.5}
The \(\mathit{derivative}\) of a function \(\mathit{f}\) ,denoted \(\mathit{f'}\), is defined by
\begin{eqnarray*}
f'(x)&=&\lim_{h \to 0}\frac{f(x+h)-f(x)}{h}
\end{eqnarray*}
\end{block}
\begin{block}{5.6}
A real-valued function \(\mathit{f}\) is \(\mathit{convex}\) on an interval\(\mathit{I}\) f \[
f(\lambda x + (1-\lambda )y)\leq \lambda f(x) +(1-\lambda)f(y),
\]
for all x,y \epsilon\, I \:  and \:0 \leq \lambda \leq 1.
\end{block}
\end{frame}
\begin{frame}{ remaining parts of question 5}
\begin{block}{5.7}
    The general solution to the differential equation \[
    y"-3y'+2y=0
    \]
    is
    \[
    y= C_1e^x +C_2e^(2x).
    \]
    \end{block}
\begin{block}{5.8}
    The $\mathit{Fermat number}$ $F_n$ is defined as
    \[
    F_{n}=2^{2n},\: n\geq0.
    \]
    \end{block}
\end{frame}
\begin{frame}{Question 6}
```

File outline

We can't find any sections or subsections in this file.

Find out more about the file outline

Type here to search | 74% | 21°C Polluted air 500 | ENG | 10:27 08-11-2021

```latex
\begin{frame}{Question 6}
\begin{block}{6.1}
  ${\frac{d}{dx}}(\frac{x}{x+1}) = \frac{1}{(x+1)^2}$\\
  \end{block}
  \begin{block}{6.2}
    $\lim_{x \to \infty}(1+\frac{1}{n})^n =e$\\
   \end{block}
\end{frame}
\begin{frame}{remaining parts of question 6}
\begin{block}{6.3}
\[
    \begin{vmatrix}
    a & b\\
    c & d
    \end{vmatrix}
    =
    ad - bc
    \]
     \end{block}
    \begin{block}{6.4}
    \[
R_\theta =
    \left[
    \begin{array}{cc}
        cos\theta & -sin\theta  \\
         sin\theta & cos\theta
    \end{array}
    \right]
    \]
\end{block}
 \end{frame}
     \begin{frame}{ remaining parts of question 6}
\begin{block}{6.5}
\[
    \begin{vmatrix}
    i & j & k\\
    a_1 & a_2 & a_3\\
    b_1 & b_2 & b_3
    \end{vmatrix}
    =
    i\begin{vmatrix}
```

Chapter 9 (Donald & Erickson) | (1) WhatsApp | Meet - sxe-nkim-ebv | assignment - Online LaTeX Editor | Assignment 2

overleaf.com/project/615eb277b4d80e66e158dae2

Menu | assignment | Review | Share | Submit | History | Chat

Source | Rich Text

main.tex

Thank u slide.jpg

```
    i\begin{vmatrix}
    a_2 & a_3\\
    b_2 & b_3
    \end{vmatrix}
    -
    \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
    \]
     \end{block}
\begin{block}{6.6}
\[
\left[
    \begin{array}{cc}
        a_{11} & a_{12}\\
        a_{21} & a_{22}
    \end{array}
    \right]
    \left[
    \begin{array}{cc}
        b_{11} & b_{12}\\
        b_{21} & b_{22}
    \end{array}
     \right]
    =
\left[
    \begin{array}{cc}
        a_{11} b_{11} +a_{12} b_{21} & a_{11} b_{12}+ a_{12} b_{22}\\
        a_{21} b_{11}+ a_{22} b_{21} & a_{21} b_{12}+ a_{22} b_{22}
    \end{array}
    \right]
    \]
     \end{block}
\end{frame}
```

File outline

We can't find any sections or subsections in this file.

Find out more about the file outline

Type here to search | 75% | 21°C Polluted air 500 | ENG | 10:27 08-11-2021

Assignment 2

Anita
College Rollno. MAT/20/55
University Roll no. 20044563008

Mata Sundri College for Women
University of Delhi

Copy point 1 on page number 69

part-1

- Let $\mathrm{x} = (x_1, \ldots, x_n)$, where the x_i are non-negative real numbers. Set

$$M_r(\mathrm{x}) = \left(\frac{x_1^r + x_2^r + \cdots + x_n^r}{n}\right)^{1/r}, \quad r \in \mathrm{R} \setminus \{0\},$$

and

$$M_0(\mathrm{x}) = (x_1 x_2 \ldots x_n)^{1/n}$$

We call $M_r(\mathrm{x})$ the *rth power mean* of x.
Claim:

$$\lim_{r\to 0} M_r(\mathrm{x}) = M_0(\mathrm{x}).$$

copy point 2 on page 69

part-2

- Define

$$V_n = \begin{bmatrix} 1 & 1 & 1 & \dots & 1 \\ x_1 & x_2 & x_3 & \dots & x_n \\ x_1^2 & x_2^2 & x_3^2 & \dots & x_n^2 \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ x_1^{n-1} & x_2^{n-1} & x_3^{n-1} & \dots & x_n^{n-1} \end{bmatrix}.$$

We call V_n the *Vander monde matrix* of order n.

Claim:

$$\det V_n = \prod_{1 \le i < j \le n} (x_j - x_i).$$

Questions 4

4.1

$3^3 + 4^3 + 5^3 = 6^3$

4.2

$\sqrt{100} = 10$

4.3

$(a+b)^3 = a^3 + b^3 + 3ab^2 + 3ba^2$

remaining parts of question 4

4.4

$\sum_{k=1}^{n} \frac{n(n+1)}{2}$

4.5

$\frac{\pi}{4} = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \cdots$

4.6

$cos\theta = sin(90^\circ - \theta)$

4.7

$e^{i\theta} = Cos(\theta) + isin(\theta)$

remaining parts of question 4

4.8

$\lim_{\theta \to 0} \frac{sin(\theta)}{\theta} = 1$‘

4.9

$\lim_{x \to \infty} \frac{\pi(x)}{x/\log x} = 1$

4.10

$\int_{-\infty}^{\infty} e^{-x^2} dx = \sqrt{\pi}$

Question 5.

5.1

Positive numbers a,b and c are the side lengths of triangle if and only if a+b>c, b+c >a, c+a > b.

5.2

The area of triangle with side length a , b , c is given by *Heoren's formula*:

$$A = \sqrt{(s)(s-a)(s-b)(s-c)},$$

where s is the semiperemeter $\frac{a+b+c}{2}$.

remaining parts of questio 5

5.3

The volume of a rectangular tetrahedron of edge length 1 is $\frac{\sqrt{2}}{12}$

5.4

The quadratic equation $ax^2 + bx + c = 0$ has roots

$$r_1, r_2 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

remaining parts of question 5

5.5

The *derivative* of a function f ,denoted f', is defined by

$$f'(x) \quad = \quad \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$

5.6

A real-valued function f is *convex* on an interval$I$ f

$$f(\lambda x + (1-\lambda)y) \leq \lambda f(x) + (1-\lambda)f(y),$$

for all x,y $\epsilon \, I$ *and* $0 \leq \lambda \leq 1$.

remaining parts of question 5

5.7

The general solution to the differential equation

$$y'' - 3y' + 2y = 0$$

is

$$y = C_1 e^x + C_2 e^(2x).$$

5.8

The *Fermatnumber* F_n is defined as

$$F_n = 2^{2n},\ n \geq 0.$$

Question 6

6.1

$\frac{d}{dx}(\frac{x}{x+1}) = \frac{1}{(x+1)^2}$

6.2

$\lim_{x\to\infty}(1+\frac{1}{n})^n = e$

remaining parts of question 6

6.3

$$\begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$$

6.4

$$R_\theta = \begin{bmatrix} cos\theta & -sin\theta \\ sin\theta & cos\theta \end{bmatrix}$$

remaining parts of question 6

6.5

$$\begin{vmatrix} i & j & k \\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{vmatrix} = i \begin{vmatrix} a_2 & a_3 \\ b_2 & b_3 \end{vmatrix} - \begin{vmatrix} a_1 & a_3 \\ b_1 & b_3 \end{vmatrix} j - \begin{vmatrix} a_1 & a_2 \\ b_1 & b_2 \end{vmatrix} k$$

6.6

$$\begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix} \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix} = \begin{bmatrix} a_{11}b_{11} + a_{12}b_{21} & a_{11}b_{12} + a_{12}b_{22} \\ a_{21}b_{11} + a_{22}b_{21} & a_{21}b_{12} + a_{22}b_{22} \end{bmatrix}$$

remaining parts of question 6

6.7

$$f(x) = \begin{cases} -x^2, x < 0 \\ x^2, 0 \leq 2 \\ 4, x \geq 2 \end{cases}$$

question 7

7.1

$$
\begin{aligned}
1+2 &= 3 \\
4+5+6 &= 7+8 \\
9+10+11+12 &= 13+14+15 \\
16+17+18+19+20 &= 21+22+23+24 \\
25+26+27+28+29+30 &= 31+32+33+34+35
\end{aligned}
$$

remaining parts of question 7

7.2

$$
\begin{aligned}
(a+b)^2 &= (a+b)(a+b) \\
&= (a+b)a + (a+b)b \\
&= a(a+b) + b(a+b) \\
&= a^2 + ab + ba + b^2 \\
&= a^2 + ab + ab + b^2 \\
&= a^2 + 2ab + b^2
\end{aligned}
$$

remaining parts of question 7

7.3

$$\begin{aligned}
\tan(\alpha+\beta+\gamma) &= \frac{\tan\alpha+\beta+\tan\gamma}{1-\tan\alpha+\beta\tan\gamma} \\
&= \frac{\frac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta}+\tan\gamma}{1-(\frac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta})\tan\gamma} \\
&= \frac{\tan\alpha+\tan\beta+(1-\tan\alpha\tan\beta)\tan\gamma}{1-\tan\alpha\tan\beta-(\tan\alpha+\tan\beta)\tan\gamma} \\
&= \frac{\tan\alpha+\tan\beta+\tan\gamma-\tan\alpha\tan\beta\tan\gamma}{1-\tan\alpha\tan\beta-\tan\alpha\tan\gamma-\tan\beta\tan\gamma}
\end{aligned}$$

remaining parts of question 7

7.4

$$\prod_p (1 - \frac{1}{p^2}) = \prod_p \frac{1}{1 + \frac{1}{p^2} + \frac{1}{p^3} + \frac{1}{p^4} + \cdots}$$
$$= (\prod_p (1 + \frac{1}{p^2} + \frac{1}{p^3} + \cdots))^{-1}$$
$$= (1 + \frac{1}{2^2} + \frac{1}{3^2} + \cdots)^{-1}$$
$$= \frac{6}{\pi^2}$$


thank you !