Assignment #02

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Chapter 1

Paragraph

1.1 Using Paragraph to change in font size and types

XYZ `This website provides the facility for students to learn different courses and know about the curriculum and information regarding different courses of the institution that are uploaded there. The institutions data can be made available, and thus can advertise themselves on the website.`

ABC *It provides an online connectivity between the students and the university, that what is the sytem following, courses offered, etc. It gives the students an opportunity to learn different things online. Also it provides the platform for different institutions to promote themselves, by adding manual advertisements, and already by contributing in courses added.S*

Chapter 2

Algebra

2.1 Solve the following Equation::

2.1.1 $5x^2 - 2x + 1 = 0$

$$x = \frac{-2 + \sqrt{(-2)^2 - 4*5*1}}{2*5}, x = \frac{-2 - \sqrt{(-2)^2 - 4*5*1}}{2*5}$$

$$x = \frac{-2 + \sqrt{-16}}{10}, x = \frac{-2 - \sqrt{-16}}{10}$$

$$x = \frac{-2 + 4\sqrt{i}}{10}, x = \frac{-2 - 4\sqrt{i}}{10}$$

$$x = \frac{-1 + 2\sqrt{i}}{5}, x = \frac{-1 - 2\sqrt{i}}{5}$$

2.1.2 $\int x \cos x^2 d(x)$

Let $u = x^2$. Then $du = 2xdx$, so $\frac{1}{2}du = xdx$. Rewrite using u and $du =$

$$\int \cos(u) \frac{1}{2} du$$

Since $\frac{1}{2}$ is constant with respect to u, the integral of $\frac{\cos u}{2}$ w.r.t. u is $\frac{1}{2}\int \cos(udu$
=

$$\frac{1}{2}\int \cos udu$$

The integral of $\cos u$ w.r.t. u is $\sin u =$

$$\frac{1}{2}(\sin u + C)$$

=

$$\frac{1}{2}\sin x^2 + C$$

2.1.3 $(a + b)^5$ *Using Binomial Formula*

$$(a+b)^5 = \sum_{k}^{5}\left(\frac{5!}{k!(5-k)!}\right)a^{5-k}b^k$$

$$= \left(\frac{5!}{0!(5-0)!}\right)a^{5-0}b^0 + \left(\frac{5!}{1!(5-1)!}\right)a^{5-1}b^1 + \left(\frac{5!}{2!(5-2)!}\right)a^{5-2}b^2 + \left(\frac{5!}{3!(5-3)!}\right)a^{5-3}b^3\left(\frac{5!}{4!(5-4)!}\right)a^{5-}$$

$$= \left(\frac{5!}{0!5!}\right)a^5b^0 + \left(\frac{5!}{1!4!}\right)a^4b^1 + \left(\frac{5!}{2!3!}\right)a^3b^2 + \left(\frac{5!}{3!2!}\right)a^3b^2 + \left(\frac{5!}{4!1!}\right)a^1b^4 + \left(\frac{5!}{5!0!}\right)a^0b^5$$

$$= \left(\frac{1}{1}\right)a^5b^0 + \left(\frac{5}{1}\right)a^4b^1 + \left(\frac{10}{1}\right)a^3b^2 + \left(\frac{10}{1}\right)a^2b^3 + \left(\frac{5}{1}\right)a^1b^4 + \left(\frac{1}{1}\right)a^0b^5$$

$$= a^5 + 5a^4b + 10a^3b^2 + 10a^2b^3 + 5ab^4 + b^5$$

2.1.4 $\sum x^2$

$$\sum_{1}^{n} x^2 = 1^2 + 2^2 + ... + n^2$$

$$= \frac{n(n+1)(2n+1)}{6}$$

Chapter 3

Matrix Multiplication

3.1 Multiply two matrices of orders 3x2 and 2x4

$$\begin{bmatrix} 1 & 0 \\ 1 & 1 \\ 1 & 3 \end{bmatrix} \begin{bmatrix} 1 & 2 & 2 & 2 \\ 2 & 3 & 1 & 0 \end{bmatrix}$$

Solution

$$\begin{bmatrix} 1 & 0 \\ 1 & 1 \\ 1 & 3 \end{bmatrix} \begin{bmatrix} 1 & 2 & 2 & 2 \\ 2 & 3 & 1 & 0 \end{bmatrix}$$

$$= \begin{bmatrix} 1*1+0*2 & 1*2+0*3 & 1*2+0*1 & 1*2+0*0 \\ 1*1+1*2 & 1*2+1*3 & 1*2+1*1 & 1*2+1*0 \\ 1*1+3*2 & 1*2+3*3 & 1*2+3*1 & 1*2+3*0 \end{bmatrix}$$

$$= \begin{pmatrix} 1 & 2 & 2 & 2 \\ 3 & 5 & 3 & 2 \\ 7 & 10 & 5 & 2 \end{pmatrix}$$

LaTeX Assignment