Date: _____

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Subject:- Numarical Anlysis

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Date:- 09-09-2020

Assiganment:- 01.

Date:

Q1:: Review of Integration Concept:

Ans: It contain some major concept of itegration, including.

- Substitution method.
- Integration by Parts.
- Integration Rational function.

*) Substitution method::

$$\rightarrow \int f(g(x)g'(x)dx = \int f(u)\,du.$$

If the function $f(u)$ has an easily indentification anti derivatives then all is well-If not, another substitution method may be needed.

*) Integration by parts::

$$\rightarrow [u(x)\,v(x)]' = u'(x)\,v(x) + u(x)\,v'(x)$$

$$= u(x)\,u'(x) = [v(x)\,u(x)]' - u'(x)\,v(x)$$

$$= \int v(x)\,v'(x)\,dx = u(x)\,u(x) - \int u'(x)\,v(x)\,dx$$

$$= \int 4\,dv = uv - \int v\,dv$$

In case of definate integrate we have use
$$\int_a^b u(x)\,v'(x)\,dx = \left[u(x)\,v(x)\right]_{x=a}^{x=b} - \int_a^b u'(x)\,v(x)\,dx$$

"Integrating Rational Function:"

$$\rightarrow \frac{3x+2}{2x^2+x-3} = \frac{3x+2}{(2x+3)(x-1)}$$

To integrate such a function, we use the method of partial fraction to split the fraction into easily integrable pieces.

$$\frac{3x+2}{(2x+3)(x-3)} = \frac{1}{2x+3} + \frac{1}{x-1}$$

Now $$\int \frac{3x+2}{2x^2+x-3}\,dx = \frac{1}{2}\log(2x+3) + \log(x-1) + c$$

Date:

Q2:- Application of Trapzoidal Rule & Simpson's Rule in Engineering.

Ans:- "Application of Trapezoidal Rule:-"

- The trapezoidal rule is one of the family member of numerical integration formula.
- The trapezoidal rule has faster Convergence.
- Moresue, the trapezoidal rule tends to become extremely accurate when periodic functions.

→ "Application of Simpson's Rule:"

- Simpson's Rule is a ~~number~~ numerical method for approximating the integral of a function between two limits, a $\int_a^b$. It's based on knowing the area under a parabola, or a plane curve.
- It include the (a) culation of a vessel's displacement, total wetted surface area, and the calculation of a vessel's displacement, total wetted surface area, the calculation of the longitudinal center of buoyancy of the hull.

It is a weightend average that results in an even more accurate approximation.