Test tex!

NUAA

Janurary 2021

Introduction

1. Let's begin with a formula $e^{i\pi} + 1 = 0$

$$e = \lim_{n\to\infty}\left(1 + \frac{1}{n}\right)^n = \lim_{n\to\infty}\frac{n}{\sqrt[n]{n!}}$$

2. we can do another:

$$e = \sum_{n=0}^{\infty}\frac{1}{n}.$$

3. we can also use continued fractions:

$$e = 2 + \cfrac{1}{1 + \cfrac{2}{2 + \cfrac{3}{3 + \cfrac{4}{4 + \cfrac{5}{5 + \ddots}}}}}$$

More formulas

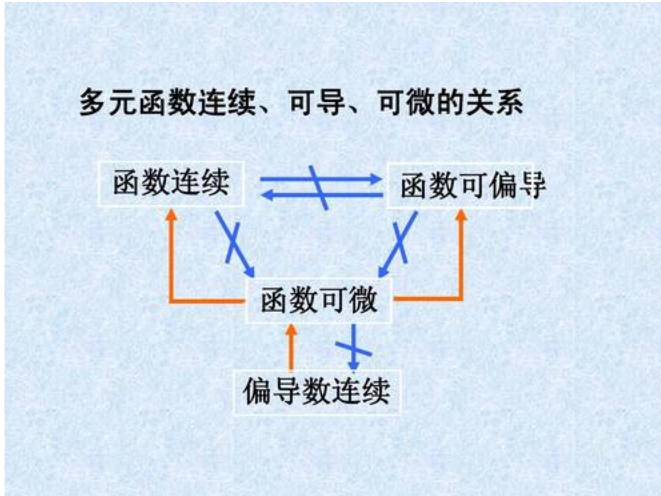
$$\int_a^b f(x)dx$$

$$\iiiint f(x, y, z)dxdydz$$

$$\vec{v} =< v_1, v_2, v_3 >$$

$$\vec{v}\cdot\vec{w}$$

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$$



1.1 ***A*** *find the sum of* 34 *and* 126 *using a caculator.*

$$34 + 126 = \boxed{160}$$

B *Find the sum using long addition.*

$$\begin{array}{cccc} & & 1 & 0 \\ & & 3 & 4 \\ + & 1 & 2 & 6 \\ \hline & 1 & 6 & 0 \end{array}$$

1.2 *Evaluate the following definite integral:*

$$\int_0^3 2x\sqrt{x^2+4}dx$$

$$u = x^2 + 4 \quad du = 2x$$

$$\Rightarrow \int_{0^2+4}^{3^2+4} \sqrt{u}du = \frac{1}{2}u^{-\frac{1}{2}}\Big|_4^{13}$$

$$\frac{1}{2\sqrt{13}} - \frac{1}{2\sqrt{4}} \approx \boxed{-0.1113}$$

2.1 ***A*** *Find the root of the quadratic equation* $y = x^2 + 2x - 3$ *using the quadratic formula.*

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

1 *Weighted Residual Methods*

Fundamental equations Consider the problem governed by the differential equation:

$$\boldsymbol{\Gamma u} = -\overline{\boldsymbol{f}} \quad in\ D$$

The above differential equation is solved by using the boundary conditions given as follows:

$$\boldsymbol{u} = -\overline{\boldsymbol{u}} \quad on\ S_u$$

$$\boldsymbol{t} \equiv \boldsymbol{Bu} = \overline{\boldsymbol{t}} \quad on\ S \backslash S_t$$

where the boundary S consists of S_t and S_u. The boundary conditions given in eqs.(84) *and* (85) *are called rigid and natural boundary conditions,or Dirichlet and Neumann boundary conditions,respectively. In most engineering problems,*$\mathbf{\Gamma}$ *and* $\boldsymbol{B}$ *are different operators in the forms of* $bm\Gamma = \mathbf{\Delta} \cdot \boldsymbol{\Sigma}$ *and* $\boldsymbol{B} = \boldsymbol{n} \cdot \boldsymbol{\Sigma}$*,where* ς *is another differential operators and* $\boldsymbol{n}$ *is the normal vector on* S_t.

$$\Delta^2 u = -\,\overline{f} \quad in\ D,$$