

Topic(s) :

Chapter 4: Integration by Partial Fraction (आंशिक भिन्नो द्वारा समाकलन)

Introduction (परिचय)

- (1) What is PARTIAL fraction ? आंशिक भिन्न क्या हैं ?
- (2) Why do we use partial fraction in integration? समाकलन में आंशिक भिन्न का प्रयोग क्यों करते हैं ?
- (3) Working rule कार्य विधि

(A) Proper Fraction/ Function

सामान्य भिन्न/फलन

(B) Improper Fraction/ Function

असामान्य भिन्न/फलन

For PDF Download : Join Telegram Group KHUSHI FOUNDATION ACADEMY

For any error: Read pin comment

(1) What is PARTIAL fraction ? आंशिक भिन्न क्या है ?

$$\frac{1}{3} = \frac{1}{6} + \frac{1}{6}$$

Fraction

(भिन्न)

Partial Fraction

(आंशिक भिन्न)

Similarly:

ईसी प्रकार से

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

Fraction

(भिन्न)

Partial Fraction

(आंशिक भिन्न)

$$\frac{1}{6} + \frac{1}{6} = \frac{1+1}{6} = \frac{2}{6} = \frac{1}{3}$$

$$\begin{aligned} \frac{1}{x} + \frac{-1}{x+1} &= \frac{x+1 + (-1)x}{x(x+1)} = \frac{x+1-x}{x(x+1)} \\ &= \frac{1}{x(x+1)} \end{aligned}$$

(2) Why do we use partial fraction in integration? समाकलन में आंशिक भिन्न का प्रयोग क्यों करते हैं ?

$$\int \frac{1}{x(x+1)} dx = \int \left(\frac{1}{x} + \frac{-1}{x+1} \right) dx$$

$$= \int \left(\frac{1}{x} - \frac{1}{x+1} \right) dx$$

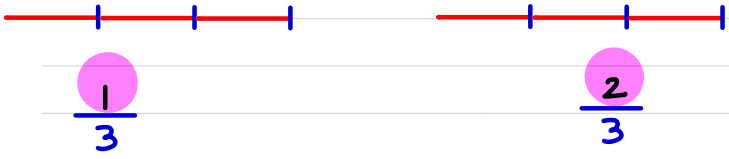
$$= \int \frac{1}{x} dx - \int \frac{1}{x+1} dx$$

$$= \log|x| - \log|x+1| + c$$

Ans:

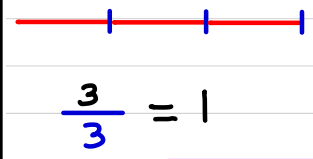
$$\int \frac{1}{ax+b} dx = \frac{\log|ax+b|}{a} + c$$

Fraction: भिन्न



Proper Fraction

सामान्य भिन्न



$$\frac{3}{3} = 1$$

Improper Fraction

असामान्य भिन्न

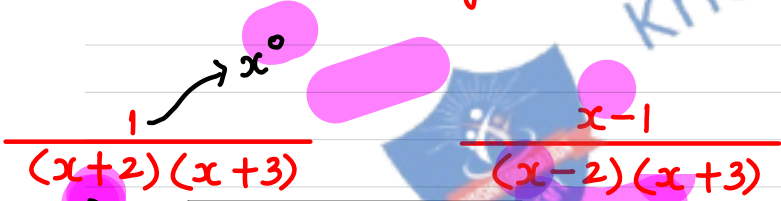


$$\frac{4}{3} = \frac{3+1}{3} = \frac{3}{3} + \frac{1}{3}$$

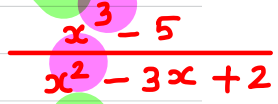
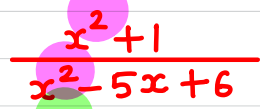
$$= 1 + \frac{1}{3}$$

Function: फलन

$\frac{f(x)}{g(x)}$



Proper Function
सामान्य फलन



Improper Function
असामान्य फलन

(3) Working rule for Proper Function (सामान्य फलन की कार्य विधि)

Type

Proper Function

Corresponding Partial Fraction

1

$$\frac{f(x)}{(x-\alpha)(x-\beta)(x-\gamma)} = \frac{A}{(x-\alpha)} + \frac{B}{(x-\beta)} + \frac{C}{(x-\gamma)}$$

2

$$\frac{f(x)}{(x-\alpha)(x-\beta)^2} = \frac{A}{(x-\alpha)} + \frac{B}{(x-\beta)} + \frac{C}{(x-\beta)^2}$$

3

$$\frac{f(x)}{(x-\alpha)(ax^2+bx+c)} = \frac{A}{(x-\alpha)} + \frac{Bx+C}{(ax^2+bx+c)}$$

↓
When linear factorisation of (ax^2+bx+c) is NOT Possible

जब (ax^2+bx+c) का एकघातीय गुणखण्ड सम्भव न हो।

e.g: x^2+x+1

Next video:

Previous Years Questions (PYQ)

LIKE

YouTube Channel

SHARE

Khushi Foundation Academy

SUBSCRIBE

Khushi Foundation
Academy



THANK YOU