ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

FOR GOD AND COUNTRY

Worksheet-13

SUBJECT – MATHEMATICS

Pre-test

Chapter: Integration **Class: XII**

Topic: Integration By Parts **Date: 30.06.2020**

Choose the correct option **(1 X 15= 15)**

1. $\int x\sec^2 x\,dx =$

(A) $\tan x + \ln\cos x + c$ **(B)** $\frac{x^2}{2}\sec^2 x + \ln\cos x + c$

(C) $x\tan x + \ln\sec x + c$ **(D)** $x\tan x + \ln\cos x + c$

2. $\int \sin(\ln x)\,dx =$

(A) $\frac{1}{2}x(\cos(\ln x) - \sin(\ln x)) + c$

(B) $\cos(\ln x) - x + c$

(C) $\frac{1}{2}x(\sin(\ln x) - \cos(\ln x)) + c$

(D) $-\cos(\ln x) + c$

3. If $\int x \sin x \, dx = -x \cos x + A$, then $A =$

(A) $\sin x + c$ **(B)** $\cos x + c$

(C) Constant **(D)** None of these

4. $\int x \ln x \, dx =$

(A) $\frac{x^2}{2} \ln x - \frac{x^2}{2} + c$ **(B)** $\frac{x^2}{2} \ln x - \frac{x^2}{4} + c$

(C) $\frac{x^2}{2} \ln x + \frac{x^2}{2} + c$ **(D)** None of these

5. $\int x \cos dx =$

(A) $x \sin x + \cos x + c$ **(B)** $x \sin x - \cos x + c$

(C) $x \cos x + \sin x + c$ **(D)** $x \cos x - \sin x + c$

6. $\int x \cos^2 x \, dx =$

(A) $\frac{x^2}{4} - \frac{1}{4} x \sin 2x - \frac{1}{8} \cos 2x + c$

(B) $\frac{x^2}{4} + \frac{1}{4} x \sin 2x + \frac{1}{8} \cos 2x + c$

(C) $\frac{x^2}{4} - \frac{1}{4} x \sin 2x + \frac{1}{8} \cos 2x + c$

(D) $\frac{x^2}{4} + \frac{1}{4} x \sin 2x - \frac{1}{8} \cos 2x + c$

7. $\int \tan^{-1} x\,dx =$

(A) $x\tan^{-1}x+\frac{1}{2}(\ln(1+x^2))+c$

(B) $x\tan^{-1}x-\frac{1}{2}(\ln(1+x^2))+c$

(C) $(x-1)\tan^{-1}x+c$

(D) $x\tan^{-1}x-x\ln(1+x^2)+c$

8. $\int x\tan^{-1} x\,dx =$

(A) $\frac{(1+x^2)}{2}\tan^{-1}x-\frac{x}{2}+c$

(B) $\frac{(x^2-1)}{2}\tan^{-1}x-\frac{x}{2}+c$

(C) $\frac{(x^2+1)}{2}\tan^{-1}x+\frac{x}{2}+c$

(D) $\frac{(x^2+1)}{2}\tan^{-1}x-x+c$

9. $\int\left(\ln(\ln x)+\frac{1}{(\ln x)^2}\right)dx =$

(A) $x\ln(\ln x)+\frac{x}{(\ln x)}+c$

(B) $x\ln(\ln x)-\frac{x}{(\ln x)}+c$

(C) $x\ln(\ln x)+\frac{\ln x}{x}+c$

(D) $x\ln(\ln x)-\frac{\ln x}{x}+c$

10. $\int (\sin(\ln x)+\cos(\ln x))\,dx =$

(A) $x\cos(\ln x)+c$ **(B)** $\sin(\ln x)+c$

(C) $\cos(\ln x)+c$ **(D)** $x\sin(\ln x)+c$

11. $\int \frac{\sqrt{5+x^{10}}}{x^{16}}\,dx$ is equal to

(A) $-\frac{1}{75}\left(1+\frac{5}{x^{10}}\right)^{3/2}+c$ **(B)** $-\frac{1}{75}\left(1-\frac{5}{x^{10}}\right)^{3/2}+c$

(C) $\frac{1}{75}\left(1-\frac{5}{x^{10}}\right)^{3/2}+c$ **(D)** $\frac{1}{75}\left(1+\frac{5}{x^{10}}\right)^{3/2}+c$

12. $\int \text{cosec}^6 x\,dx$ is equal to

(A) $-\cot x-\frac{\cot^5 x}{5}-\frac{2\cot^5 x}{3}+k$

(B) $-\frac{\cot x}{3}+\frac{2\cot^5 x}{5}+2\cot^{-3} x+k$

(C) $\frac{\tan^3 x}{3}-\frac{\tan x}{5}+2\tan^3 x+k$

(D) None of these

13. $\int \frac{(\sqrt{x^2+1})\{\ln(x^2+1)-2\ln x\}}{x^4}dx$ is equal to

(A) $\frac{(x^2+1)\sqrt{x^2+1}}{x^3}\left[2-3\ln\left(\frac{x^2+1}{x^2}\right)\right]+c$

(B) $\frac{(x^2+1)\sqrt{x^2+1}}{9x^3}\left[2+3\ln\left(\frac{x^2+1}{x^2}\right)\right]+c$

(C) $\frac{(x^2+1)\sqrt{x^2+1}}{x^3}\left[2+3\ln\left(\frac{x^2+1}{x^2}\right)\right]+c$

(D) $\frac{(x^2+1)\sqrt{x^2+1}}{9x^3}\left[2-3\ln\left(\frac{x^2+1}{x^2}\right)\right]+c$

14 $\int \frac{dx}{(2x+3)\sqrt{4x+5}}$ is equal to

(A) $\tan^{-1}\sqrt{4x-5}+c$ **(B)** $\tan^{-1}\sqrt{4x+5}+c$

(C) $\tan^{-1}\sqrt{5x+4}+c$ **(D)** $\tan^{-1}\sqrt{5x-4}+c$

15. $\int \frac{dx}{5+4\cos x}$ is equal to

(A) $\frac{2}{3}\tan^{-1}\left(\frac{1}{3}\tan\frac{x}{2}\right)+c$ **(B)** $-\frac{2}{3}\tan^{-1}\left(\frac{1}{3}\tan\frac{x}{2}\right)+c$

(C) $\frac{1}{3}\tan^{-1}\left(\frac{1}{3}\tan\frac{x}{2}\right)+c$ **(D)** None of these

Prepared by :-
SUKUMAR MANDAL (SkM).