ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

FOR GOD AND COUNTRY

Worksheet-11

SUBJECT – MATHEMATICS

Pre-test

Chapter: Integration **Class: XII**

Topic: Method of substitution **Date: 23.06.2020**

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

1. $\int \frac{dx}{x\sqrt{1-(\ln x)^2}} =$

(A) $\cos^{-1}(\ln x)+c$ **(B)** $x\ln(1-x^2)+c$

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

2. $\int \frac{f'(x)dx}{(f(x))^2} =$

(A) $-(f(x))^{-1}+c$ **(B)** $\ln(f(x))+c$

(C) $e^{f(x)}+c$ **(D)** None of these

3. For which of the following functions, the substitution $x^2 = t$ is applicable?

(A) $\int x^6 \tan^{-1}x^3\,dx$ **(B)** $\int \tan^{-1}\left(\frac{2x}{1-x^2}\right)dx$

(C) $\int x^3 \cos x^2\,dx$ **(D)** None of these

4. $\int \tan x \cdot \sec^2 x \cdot \sqrt{1-\tan^2 x}\;dx =$

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

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

5. $\int \frac{\sin 2x}{\sin 5x \cdot \sin 3x} dx =$

(A) $\ln\sin 3x - \ln\sin 5x + c$

(B) $\frac{1}{3}\ln\sin 3x + \frac{1}{5}\ln\sin 5x + c$

(C) $\frac{1}{3}\ln\sin 3x - \frac{1}{5}\ln\sin 5x + c$

(D) $3\ln\sin 3x - 5\ln\sin 5x + c$

6. $\int \frac{e^x}{\sqrt{1-e^{2x}}} dx =$

(A) $\cos^{-1}(e^x) + c$ **(B)** $-\cos^{-1}(e^x) + c$

(C) $\cos^{-1}(e^{2x}) + c$ **(D)** $\sqrt{1-e^{2x}} + c$

7. $\int (\sec x + \tan x)^2 dx =$

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

(C) $\sec x(\sec x + \tan x) + c$ **(D)** $2(\sec x + \tan x) + c$

8. $\int x^{51}(\tan^{-1} x + \cot^{-1} x)\, dx =$

(A) $\frac{x^{52}}{52}(\tan^{-1} x + \cot^{-1} x) + c$ **(B)** $\frac{x^{52}}{52}(\tan^{-1} x - \cot^{-1} x) + c$

(C) $\frac{\pi x^{52}}{104} + \frac{\pi}{2} + c$ **(D)** $\frac{\pi x^{52}}{52} + \frac{\pi}{2} + c$

9. $\int \frac{\sec^2 x}{\sqrt{\tan^2 x + 4}} dx =$

(A) $\ln\left(\tan x + \sqrt{\tan^2 x + 4}\right) + c$

(B) $\frac{1}{2}\ln\left(\tan x + \sqrt{\tan^2 x + 4}\right) + c$

(C) $\ln\left(\frac{1}{2}\tan x + \frac{1}{2}\sqrt{\tan^2 x + 4}\right) + c$

(D) None of these

10. $\int \frac{2x \cdot \tan^{-1} x^2}{x^4+1} dx =$

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

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

11. $\int \left(1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \ldots\right) dx =$

(A) $-e^x + c$ **(B)** $e^x + c$

(C) $e^{-x} + c$ **(D)** $-e^{-x} + c$

12. $\int \frac{\cot x \cdot \tan x}{\sec^2 x - 1} dx =$

(A) $\cot x - x + c$ **(B)** $-\cot x + x + c$

(C) $\cot x + x + c$ **(D)** $-\cot x - x + c$

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

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

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

14. $\int \frac{1}{1 - \sin x} dx =$

(A) $x + \cos x + c$ **(B)** $1 + \sin x + c$

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

15. $\int \frac{\tan x}{\sec x + \tan x} dx =$

(A) $\sec x + \tan x - x + c$ **(B)** $\sec x - \tan x + x + c$

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

Prepared by :-
SUKUMAR MANDAL (SkM).