



**Solutions of Worksheet-14**

**SUBJECT – MATHEMATICS**

**Pre-test**

Chapter: Integration

Class: XII

Topic: Special forms

Date: 09.07.2020

Choose the correct option

(1 X 15= 15)

1.  $\int \frac{dx}{5+4\cos x} =$

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

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

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

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

**Ans. (C)**

2.  $\int \frac{dx}{(x^2+a^2)(x^2+b^2)} =$

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

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

(C)  $\left( \frac{1}{b} \tan^{-1}\left(\frac{x}{b}\right) - \frac{1}{a} \tan^{-1}\left(\frac{x}{a}\right) \right) + c$

(D)  $-\left( \frac{1}{b} \tan^{-1}\left(\frac{x}{b}\right) - \frac{1}{a} \tan^{-1}\left(\frac{x}{a}\right) \right) + c$

**Ans. (A)**

3.  $\int \frac{1}{1+\cos^2 x} dx =$

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

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

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

(D) None of these **Ans. (C)**

4.  $\int \frac{1}{1+3\sin^2 x} dx =$

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

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

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

(D) None of these **Ans. (B)**

5.  $\int \frac{1}{2x^2 + x + 1} dx$  equals

(A)  $\frac{1}{\sqrt{7}} \tan^{-1}\left(\frac{4x+1}{\sqrt{7}}\right) + c$

(B)  $\frac{1}{2\sqrt{7}} \tan^{-1}\left(\frac{4x+1}{\sqrt{7}}\right) + c$

(C)  $\frac{1}{2} \tan^{-1}\left(\frac{4x+1}{\sqrt{7}}\right) + c$

(D) None of these **Ans. (D)**

6.  $\int \frac{dx}{7+5\cos x} =$

(A)  $\frac{1}{\sqrt{6}} \tan^{-1}\left(\frac{1}{\sqrt{6}} \tan \frac{x}{2}\right) + c$

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

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

(D)  $\frac{1}{7} \tan^{-1}\left(\tan \frac{x}{2}\right) + c$

**Ans. (A)**

7.  $\int \frac{1}{x^2 + 4x + 13} dx$  is equal to

(A)  $\ln|x^2 + 4x + 13| + c$

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

(C)  $\ln|2x + 4| + c$

(D)  $\frac{(2x+4)}{(x^2 + 4x + 13)^2} + c$

**Ans. (B)**

8.  $\int \frac{dx}{\cos x - \sin x}$  is equal to

(A)  $\frac{1}{\sqrt{2}} \ln \left| \tan \left( \frac{x}{2} + \frac{3\pi}{8} \right) \right| + c$

(B)  $\frac{1}{\sqrt{2}} \ln \left| \cot \frac{x}{2} \right| + c$

(C)  $\frac{1}{\sqrt{2}} \ln \left| \tan \left( \frac{x}{2} - \frac{3\pi}{8} \right) \right| + c$

(D)  $\frac{1}{\sqrt{2}} \ln \left| \tan \left( \frac{x}{2} - \frac{\pi}{8} \right) \right| + c$

**Ans. (A)**

9.  $\int \frac{1}{x^2 + 2x + 2} dx =$

(A)  $\sin^{-1}(x+1) + c$

(B)  $\sinh^{-1}(x+1) + c$

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

(D)  $\tan^{-1}(x+1) + c$  **Ans. (D)**

10.  $\int \frac{3 \sin x + 2 \cos x}{3 \cos x + 2 \sin x} dx =$

- (A)  $\frac{12}{13}x - \frac{5}{13} \ln|3 \cos x + 2 \sin x| + c$   
 (B)  $\frac{12}{13}x + \frac{5}{13} \ln|3 \cos x + 2 \sin x| + c$   
 (C)  $\frac{13}{12}x + \frac{5}{13} \ln|3 \cos x + 2 \sin x| + c$   
 (D) None of these

**Ans. (A)**

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

- (A)  $\frac{1}{2} \ln(x-1) - \frac{1}{4} \ln(x^2+1) - \frac{1}{2} \tan^{-1} x + c$   
 (B)  $\frac{1}{2} \ln(x-1) + \frac{1}{4} \ln(x^2+1) - \frac{1}{2} \tan^{-1} x + c$   
 (C)  $\frac{1}{2} \ln(x-1) - \frac{1}{2} \ln(x^2+1) - \frac{1}{2} \tan^{-1} x + c$   
 (D) None of these

**Ans. (A)**

12.  $\int \frac{(x^2 + x - 1) dx}{(x^2 + x - 6)} =$

- (A)  $x + \ln(x+3) + \ln(x-2) + c$   
 (B)  $x - \ln(x+3) + \ln(x-2) + c$   
 (C)  $x - \ln(x+3) - \ln(x-2) + c$   
 (D) None of these

**Ans. (B)**

13  $\int \frac{x^2 dx}{(x^2 + 2)(x^2 + 3)} =$

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

**Ans. (B)**

14  $\int \frac{dx}{(x^2 + 1)(x^2 + 4)} =$

- (A)  $\frac{1}{3} \tan^{-1} x - \frac{1}{3} \tan^{-1} \frac{x}{2} + c$   
 (B)  $\frac{1}{3} \tan^{-1} x + \frac{1}{3} \tan^{-1} \frac{x}{2} + c$   
 (C)  $\frac{1}{3} \tan^{-1} x - \frac{1}{6} \tan^{-1} \frac{x}{2} + c$   
 (D)  $\tan^{-1} x - 2 \tan^{-1} \frac{x}{2} + c$

**Ans. (C)**

15  $\int \frac{dx}{\cos x(1 + \cos x)} =$

- (A)  $\ln(\sec x + \tan x) + 2 \tan \frac{x}{2} + c$   
 (B)  $\ln(\sec x + \tan x) - 2 \tan \frac{x}{2} + c$   
 (C)  $\ln(\sec x + \tan x) + \tan \frac{x}{2} + c$   
 (D)  $\ln(\sec x + \tan x) - \tan \frac{x}{2} + c$

**Ans. (D)**