



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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) $\ln(\sec x + \tan x) - \tan \frac{x}{2} + c$