

MATHS ACADEMY-BY PRACHI MA'AM
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XII

ASSIGNMENT-2

INTEGRATIONS

1. $\int \frac{dx}{\sqrt{1-x}} = ?$

- a) $2\sqrt{1-x} + c$ b) $-2\sqrt{1-x} + c$
c) $-\sin^{-1}\sqrt{x} + c$ d) $\sin^{-1}\sqrt{x} + c$

2. $\int \frac{3x^2}{x^6+1} dx = ?$

- a) $\log(x^6 + 1) + c$ b) $\tan^{-1}(x^3) + c$
c) $3 \tan^{-1}(x^3) + c$ d) $3 \tan^{-1}\left(\frac{x^3}{3}\right) + c$

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

- 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

4. The value of the integral $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\cos x}}{\sqrt{\cos x} + \sqrt{\sin x}} dx$ is:

- a) 0 b) $\frac{\pi}{2}$ c) $\frac{\pi}{4}$ d) none of these

5. $\int_0^{\frac{\pi^2}{4}} \frac{\sin \sqrt{x}}{\sqrt{x}} dx$ equals

- a) 2 b) 1 c) $\frac{\pi}{4}$ d) $\frac{\pi^2}{8}$

6. $\int_0^{\frac{\pi}{2}} \frac{\cos x}{(2+\sin x)(1+\sin x)} dx$ equals

- a) $\log\left(\frac{2}{3}\right)$ b) $\log\left(\frac{3}{2}\right)$ c) $\log\left(\frac{3}{4}\right)$ d) $\log\left(\frac{4}{3}\right)$

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7. $\int_0^{\frac{\pi}{2}} \frac{\sin x}{\sin x + \cos x} dx$ equals to

- a) π b) $\frac{\pi}{2}$ c) $\frac{\pi}{3}$ d) $\frac{\pi}{4}$

8. $I = \int_0^{2\pi} \frac{1}{1 + e^{\sin x}} dx$

9. Prove that $\int_0^a f(x).dx = \int_0^a f(a - x).dx$ and hence, prove that:

$$\int_0^{\frac{\pi}{2}} \frac{\sin x}{\sin x + \cos x} dx = \frac{\pi}{4}$$

10. Evaluate $\int_{-1}^2 f(x)dx$, where $f(x) = |x + 1| + |x| + |x - 1|$.

11. If $\int_0^1 (3x^2 + 2x + k)dx = 0$, find the value of k .

12. Evaluate $\int_0^{\pi} \frac{e^{\cos x}}{e^{\cos x} + e^{-\cos x}} dx$