INTERNATIONAL INDIAN SCHOOL BURAIDAH

Worksheet for the Academic Year 2026-27

CLASS: 12 SUBJECT: MATHEMATICS DATE: 01/11/2026

LESSON: INTEGRALS

1. Find the antiderivative of $5e^{3x} + \frac{1}{\sqrt{x}}$.

2. $\int_{-1}^{1} \frac{I\,x\,I}{X}\,dx =$

[a) -1 b) 0 c) 1 d) 2]

3. $\int \frac{2^{\frac{1}{x}}}{x^2}\,dx = k.2^x + c, then\ k =$

[a) $\frac{-1}{\log 2}$ $b) -\log 2$ $c) -1$ $d)\ \frac{1}{2}$]

4. $\int_0^{\frac{\pi}{6}} sec^2(x - \frac{\pi}{6})\,dx =$

[a) $\frac{1}{\sqrt{3}}$ $b) -\frac{1}{\sqrt{3}}$ $c)\ \sqrt{3}$ $d) -\sqrt{3}$]

5. $\frac{d}{dx}\,[f(x)] = ax + b\ and\ f(0) = 0, then\ f(x) =$

[a) a+b b) $\frac{ax^2}{2} + bx$ $c)\ \frac{ax^2}{2} + bx + c$ $d\ )\ b$]

6. Evaluate:

i) $\int \frac{2^{x+1} - 5^{x-1}}{10^x}\,dx$ (ii) $\int \frac{sin^6 x}{cos^8 x}\,dx$ $(iii)\ \int \sqrt{1 + \sin 2x}\,dx$

iv) $\int \frac{1}{x}\sqrt{\frac{x+a}{x-a}}\,dx$ (v) $\int \cot x(cosecx - 1)e^x\,dx$ (vi) $\int \frac{x + cos6x}{3x^2 + sin6x}\,dx$

vii) $\int \frac{1}{x^2+16}\,dx$ $(viii)\ \int (ax + b)^3\,dx$ $(ix)\ \int 5^x dx$

7. Evaluate :

i) $\int \frac{5x-2}{1+2x+3x^2}\,dx$ $(ii)\ \int \frac{x^2}{x^4+3x^2+2}\,dx$ $(iii)\ \int \frac{x+2}{\sqrt{x^2+5x+6}}\,dx$

vi) $\int \frac{3x+1}{(x+1)^2(x+3)}\,dx$ $(v)\ \int \frac{x}{(x^2+1)(x-1)}\,dx$ $(vi)\ \int \frac{\sin(x-a)}{\sin(x+a)}\,dx$

vii) $\int \frac{x^2}{(x^2+4)(x^2+9)}\,dx$ $(viii)\ \int \frac{2x^2+1}{x^2(x^2+4)}\,dx$ $(ix) \int \frac{dx}{x(x^3+8)}\,dx$

x) $\int \frac{1-x^2}{x-2x^2}\,dx$ $(xi)\ \int \frac{sin2x}{(1+sinx)(2+sinx)}\,dx$ $(xii)\ \int \frac{dx}{sinx - sin2x}$

8. E VALUATE THE FOLLOWING INTEGRALS ::

1) e^{xloga} 2)e^{alogx} 3)$e^x a^x$ 4)$\frac{1}{a^x b^x}$ 5)$\frac{e^{log\sqrt{x}}}{x}$ 6)$\frac{1+cos4x}{cotx-tanx}$ 7)$\frac{1}{1+sinx}$ 8)$\frac{cosx}{1+cosx}$ 9)$\sqrt{1\pm sinx}$

III. EVALUATE THE FOLLOWING INTEGRALS:

1) $\frac{tan^3 x}{cos^3 x}$ 2) $\frac{(x+1)(x-2)}{\sqrt[3]{x}}$ 3) $cos^3 x\, e^{\log sinx} dx$ 4) $\frac{1+cotx}{x+logsinx}$ 5) $\frac{\sin 2xcos2x}{\sqrt{9-cos^4 2x}}$ 6)$\frac{x^3-x}{x^4+a^2}$

7. $\frac{-sin2x}{\sqrt{cos^4 x-sin^2 x+1}}$ 8) $\frac{1}{x[3+2logx-(logx)^2]}$ 9) $\frac{(3sinx-2)cosx}{5-4sinx-cos^2 x}$ 10) $\frac{e^x(4e^x+3)}{\sqrt{2e^{2x}+2e^x-3}}$

11) $3+8x\sqrt{-2x^3+3x+5}$ 12) $\frac{x+sinx}{1+cosx}$

13. log(logx) +$\frac{1}{(logx)^2}$ 14) $e^x cos^2 x$ 15) $\frac{e^x(1-x)^2}{(1+x^2)^2}$

16) $\frac{e^x(x-4)}{(x-2)^3}$ 17) $\frac{2}{(1-x)(x^2+1)}$

18)$\frac{1}{(x+1)(x^2+2x+2)}$ 19)$\frac{x^2}{(x^2+4)(x^2+9)}$ 20) $\frac{1-x^3}{x^3+x}$

21. $\frac{1}{\cos\theta(5-4\sin\theta)}$ 22) $\frac{1}{x(x^5+3)}$ 23) $\frac{1}{xlogx(logx+2)}$

24) $\frac{x^2\sin^{-1}x}{(1-x^2)^{\frac{3}{2}}}$ 25) $\frac{x^3\sin^{-1}x^2}{\sqrt{1-x^4}}$ 26) $\frac{cos^9 x}{sinx}$

27. cosmx cosnx 28) $\frac{1}{3sinx-4cosx}$ 29)$\frac{1}{3sin^2 x+5cos^2 x}$

9. Evaluate the following definite integrals

1. $\int_4^9 \frac{\sqrt{x}}{(30-x^{\frac{3}{2}})^2}$ dx 2) $\int_0^{\frac{\pi}{4}} sin^3 2xcos2xdx$ 3) $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} sin2xlogsinxdx$

4. $\int_0^2 \frac{6x+3}{x^2+4}$ dx 5) $\int_0^1 \frac{x^2-1}{x^4+x^2+1}$ dx 6) $\int_0^1 \tan^{-1}\frac{2x}{1-x^2}$ dx

7. $\int_0^{\frac{\pi}{2}} \frac{1}{4sin^2 x+5cos^2 x}$ dx 8) $\int_0^{\frac{\pi}{4}} \frac{sin2x}{cos^4 x+sin^4 x}$ dx 9) $\int_0^1 I5x-3Idx$

10. $\int_0^{\pi} IcosxIdx$ 11) $\int_0^{\pi} \frac{x}{1-cos\alpha sinx}$dx 12)$\int_{\frac{-\pi}{3}}^{\frac{\pi}{3}} x^3 sin^4 xdx$

13. $\int_{-1}^1 (x+1)dx$ 14) $\int_{-\pi}^{\pi} \frac{x(1-sinx)}{1+cos^2 x}$dx 15) $\int_{\frac{-\pi}{4}}^{\frac{\pi}{4}} \frac{x+\frac{\pi}{4}}{2-cos2x}dx$

16. $\int_0^3 [x]dx$ 17) $\int_{-a}^{a} \sqrt{\frac{a-x}{a+x}}$dx 18) $\int_1^2 \frac{\sqrt{x}}{\sqrt{3-x+\sqrt{x}}}$dx

19. $\int_{\frac{-\pi}{4}}^0 \frac{1+\tan x}{1-ten\, x}\, dx$ 20) $\int_0^{\pi} \frac{e^{\cos x}}{e^{\cos x}+e^{-\cos x}}\, dx$

10. $\int x^3 sin^4(x^4)cos^4(x^4)dx = asin^5(x^4)+c, then\ a =$

[a) $\frac{-1}{10}$ $b)\ \frac{1}{20}$ $c)\ \frac{1}{4}$ $d)\ \frac{1}{5}$]