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BHASKAR CLASSES PVT LTD

Integration

1. Evaluate each of the following integrals:
   a. $\int x^4\, dx$
   b. $\int x^{\frac{5}{4}}\, dx$
   c. $\int \frac{1}{x^5}\, dx$
   d. $\int \frac{1}{x^{3/2}}\, dx$
   e. $\int 3^x\, dx$
   f. $\int \frac{1}{\sqrt[3]{x^2}}\, dx$
   g. $\int 3^{2\log_3 x}\, dx$
   h. $\int \log_x x\, dx$
2. Evaluate:
   a. $\int \sqrt{\frac{1+\cos 2x}{2}}\, dx$
   b. $\int \frac{1-\cos 2x}{2}\, dx$
3. Evaluate: $\int \frac{e^{6\log_e x} - e^{5\log_e x}}{e^{4\log_e x} - e^{3\log_e x}}\, dx$
4. Evaluate:
   a. $\int \frac{\cos 2x + 2\sin^2 x}{\sin^2 x}\, dx$
   b. $\int \frac{2\cos^2 x - \cos 2x}{\cos^2 x}\, dx$
5. Evaluate: $\int \frac{e^{\log\sqrt{x}}}{x}\, dx$

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6. Evaluate the following integrals:

a. $\int (3x\sqrt{x} + 4\sqrt{x} + 5)\ dx$

b. $\int \left(2^x + \frac{5}{x} - \frac{1}{x^{1/3}}\right) dx$

c. $\int \left(\sqrt{x} - \frac{1}{\sqrt{x}}\right)^2 dx$

d. $\int \frac{x^{-1/3} + \sqrt{x} + 2}{\sqrt[3]{x}}\ dx$

e. $\int \left\{x^2 + e^{\log x} + \left(\frac{e}{2}\right)^2\right\} dx$

f. $\int \frac{(x+1)(x-2)}{\sqrt{x}}\ dx$

g. $\int \frac{\sin^3 x - \cos^3 x}{\sin^2 x\ \cos^2 x}\ dx$

h. $\int \frac{5\cos^3 x + 6\sin^3 x}{2\ \sin^2 x\ \cos^2 x}\ dx$

i. $\int (\tan x + \cot x)^2\ dx$

j. $\int \frac{1 - \cos 2x}{1 + \cos 2x}\ dx$

k. $\int \frac{\cos x}{1 + \cos x}\ dx$

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