

NCERT/CBSE MATHEMATICS CLASS 12 textbook

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MISCELLANEOUS EXERCISES

Answers to NCERT/CBSE MATH (Class XII) textbook

Chapter 7

INTEGRALS

$$18. \frac{1}{\sqrt{\sin^3 x \sin(x+\alpha)}}$$

$$18. \text{Let } I = \int \frac{1}{\sqrt{\sin^3 x \sin(x+\alpha)}} dx = \int \sqrt{\frac{\sin x}{\sin^4 x \sin(x+\alpha)}} dx = \int \frac{1}{\sin^2 x} \sqrt{\frac{\sin x}{\sin(x+\alpha)}} dx$$

$$\text{Let } t^2 = \frac{\sin(x+\alpha)}{\sin x} \Rightarrow 2t dt = \frac{\sin x \cos(x+\alpha) - \sin(x+\alpha) \cos x}{\sin^2 x} dx = \frac{\sin[x-(x+\alpha)]}{\sin^2 x} dx = \frac{\sin(-\alpha)}{\sin^2 x} dx$$

$$= -\frac{\sin(\alpha)}{\sin^2 x} dx$$

$$\Rightarrow \frac{1}{\sin^2 x} dx = -2t dt$$

$$\Rightarrow I = -\int \frac{1}{t} \cdot \frac{2t}{\sin \alpha} dt = -\frac{2}{\sin \alpha} \int dt = -\frac{2t}{\sin \alpha} + c = -\frac{2}{\sin \alpha} \sqrt{\frac{\sin(x+\alpha)}{\sin x}} + c$$

Please do not copy the answer given here

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