

NCERT/CBSE MATHEMATICS CLASS 12 textbook

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MISCELLANEOUS EXERCISES

Answers to NCERT/CBSE MATH (Class XII) textbook

Chapter 7

INTEGRALS

43. If $f(a + b - x) = f(x)$, then $\int_a^b x f(x) dx$ is equal to

(A) $\frac{a+b}{2} \int_a^b f(b-x) dx$

(B) $\frac{a+b}{2} \int_a^b f(b+x) dx$

(C) $\frac{b-a}{2} \int_a^b f(x) dx$

(D) $\frac{a+b}{2} \int_a^b f(x) dx$

We know $\int_a^b f(x) dx = \int_a^b f(a+b-x) dx$

$$\therefore \int_a^b x f(x) dx = \int_a^b (a+b-x) f(a+b-x) dx = \int_a^b (a+b-x) f(x) dx$$

$$\therefore 2I = \int_a^b (a+b) f(x) dx$$

$$\therefore I = \frac{1}{2} \int_a^b (a+b) f(x) dx$$

Answer(D)

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