

5. minitest - varianta A

Integrál funkce jedné proměnné

3. 11. 2023

Vypočtete integrál

$$\int \frac{(2x+3)^2}{\sqrt[3]{x}} dx$$

$$\int \frac{(2x+3)^2}{\sqrt[3]{x}} dx = \int \frac{4x^2 + 12x + 9}{\sqrt[3]{x}} dx = \int \left(4 \cdot \frac{x^2}{\sqrt[3]{x}} + 12 \cdot \frac{x}{\sqrt[3]{x}} + 9 \cdot \frac{1}{\sqrt[3]{x}} \right)$$

$$= 4 \cdot \int x^{\frac{5}{3}} dx + 12 \cdot \int x^{\frac{2}{3}} dx + 9 \cdot \int x^{-\frac{1}{3}} dx =$$

$$= 4 \cdot \frac{x^{\frac{8}{3}}}{\frac{8}{3}} + 12 \cdot \frac{x^{\frac{5}{3}}}{\frac{5}{3}} + 9 \cdot \frac{x^{\frac{2}{3}}}{\frac{2}{3}} + c$$

$$= \frac{3}{2} x^{\frac{8}{3}} + \frac{36}{5} x^{\frac{5}{3}} + \frac{27}{2} x^{\frac{2}{3}} + c$$

5. minitest - varianta B

Integrál funkce jedné proměnné

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Vypočtete integrál

$$\int \sqrt[3]{x^2} (2x - 3)^2 dx$$

$$\int \sqrt[3]{x^2} \cdot (2x - 3)^2 dx = \int x^{\frac{2}{3}} \cdot (4x^2 - 12x + 9) dx =$$

$$= 4 \cdot \int x^{\frac{8}{3}} dx - 12 \cdot \int x^{\frac{5}{3}} dx + 9 \cdot \int x^{\frac{2}{3}} dx =$$

$$= 4 \cdot \frac{x^{\frac{11}{3}}}{\frac{11}{3}} - 12 \cdot \frac{x^{\frac{8}{3}}}{\frac{8}{3}} + 9 \cdot \frac{x^{\frac{5}{3}}}{\frac{5}{3}} + C$$

$$= \frac{12}{11} x^{\frac{11}{3}} - \frac{9}{2} x^{\frac{8}{3}} + \frac{27}{5} x^{\frac{5}{3}} + C$$