Recapitulare analiză

- clasa a XII -a C -

- 12.01.2021 -

$a > 0$

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$\sqrt[n]{a^m} = a^{\frac{m}{n}}$

$\sqrt[n]{a} = a^{\frac{1}{n}}$ $\sqrt{a} = a^{\frac{1}{2}}$

E1)

d) $\int_0^1 5\left(x\sqrt{x} - \sqrt[3]{x^2}\right) dx =$

$$= 5\left[\int_0^1 x\sqrt{x}\cdot dx - \int_0^1 \sqrt[3]{x^2}\,dx\right] =$$

$$= 5\cdot\int_0^1 x^1\cdot x^{\frac{1}{2}}\cdot dx - 5\cdot\int_0^1 x^{\frac{2}{3}}\cdot dx =$$

$$\boxed{\int x^{\alpha}\cdot dx = \frac{x^{\alpha+1}}{\alpha+1} + C}$$

$$= 5\cdot\int_0^1 x^{1+\frac{1}{2}}\cdot dx - 5\cdot\int_0^1 x^{\frac{2}{3}}\,dx =$$

$$= 5\int_0^1 x^{\frac{3}{2}}\cdot dx - 5\cdot\int_0^1 x^{\frac{2}{3}}\,dx =$$

$$= 5\cdot\frac{x^{\frac{3}{2}+1}}{\frac{3}{2}+1}\Bigg|_0^1 - 5\cdot\frac{x^{\frac{2}{3}+1}}{\frac{2}{3}+1}\Bigg|_0^1 =$$

$$= 5\left[x^{\frac{5}{2}} : \frac{5}{2} - x^{\frac{5}{3}} : \frac{5}{3}\right]\Bigg|_0^1 =$$

$$= 5\left(\sqrt{x^5}\cdot\frac{2}{5} - \sqrt[3]{x^5}\cdot\frac{3}{5}\right)\Bigg|_0^1 = \cancel{5}\cdot\frac{1}{\cancel{5}}\cdot\left(2\sqrt{x^5} - 3\sqrt[3]{x^5}\right)\Bigg|_0^1$$

$$= \underbrace{\left(2\sqrt{x^5} - 3\sqrt[3]{x^5}\right)}_{F(x)\big|_0}\Bigg|_0^1 = \left(2\sqrt{1^5} - 3\sqrt[3]{1^5}\right) -$$

$$- \left(2\cdot\sqrt{0^5} - 3\sqrt[3]{0^5}\right) = (2-3) - 0 = -\underline{1}$$

Formula Leibnitz - Newton

Dc. $f, F : I \to \mathbb{R}$ admit prim.

F - prim a lui f,

$$\boxed{\int_a^b f(x) \cdot dx = F(x) \Big|_a^b = F(b) - F(a)}$$

$F(x)$ = primitivă a lui $f(x)$

d.n.d $\Leftrightarrow F'(x) = f(x) \Leftrightarrow$

$$\boxed{\int f(x) \cdot dx = F(x)}$$

$$\sin 2\alpha = 2\sin\alpha\cdot\cos\alpha$$

$$\sin^2\alpha + \cos^2\alpha = 1$$

$$\cos 2\alpha = \cos^2\alpha - \sin^2\alpha$$
$$= 2\cos^2\alpha - 1$$
$$= 1 - 2\sin^2\alpha$$

$$\sin(\alpha \pm \beta) = \sin\alpha\cos\beta \pm \sin\beta\cos\alpha$$

$$\cos(\alpha \pm \beta) = \cos\alpha\cos\beta \mp \sin\alpha\sin\beta$$

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$\boxed{E2}$ c) $\int_0^{\frac{\pi}{2}} \underbrace{2\sin\frac{x}{2}\cos\frac{x}{2}} \cdot dx = \int_0^{\frac{\pi}{2}} \sin\left(2\cdot\frac{x}{2}\right) dx =$

$= \int_0^{\frac{\pi}{2}} \sin x \, dx = -\cos x \Big|_0^{\frac{\pi}{2}} =$

$= -\left(\cos\frac{\pi}{2} - \cos 0\right) =$

$= -(0-1) = 1$

$\boxed{(\sin x)' = \cos x}$

$\boxed{(\cos x)' = -\sin x}$

Temă | – derivatele trig.
– metodele de integrare

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