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Verifica di Matematica

$\frac{f'(x)}{f(x)}$

I) $\int \frac{2x^2}{4-x^3} \cdot dx = -2\int \frac{-x^2}{4-x^3} = -\frac{2}{3}\cdot\int \frac{-3x^2}{4-x^3} = -\frac{2}{3}\cdot \ln|4-x^3| + c$

Bene!

II) $\int \frac{3x^2+1}{\sqrt{1-x^2}} dx = \int \frac{3x^2+1}{\sqrt{1-x^2}} - \int \frac{1}{\sqrt{1-x^2}} = \int \frac{3x^2+1}{\sqrt{1-x^2}} + \arcsin x + c$

$f = \sin x \quad g' = \cos x$

III) $\int \cos^2 x\, dx = \int \cos x \cdot \cos x\, dx = \sin x \cos x + \int \sin x \cdot (-\sin x)$ **dx**

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$\int \cos^2 x\, dx - \int \sin^2 x\, dx = + \sin x \cos x + c$

$\int \cos^2 x\, dx - \int dx + \int \cos^2 x = \sin x \cos x + c \rightarrow 2\int \cos^2 x\, dx = \frac{x + \sin x \cos x}{2} + c$

IV) $\int \arctan x\, dx = \int \arctan x \cdot 1\, dx = x \arctan x - \int \frac{x}{1+x^2} = x \arctan x - \frac{1}{2}\cdot\int \frac{2x}{1+x^2} =$

$f'(x) = \frac{1}{1+x^2} \qquad g(x) = x$

$= x \arctan x - \frac{1}{2} \ln(1+x^2) + c$

Bene!

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$$\int \frac{3x^2}{\sqrt{1-x^2}}dx = 3\int \frac{x^2}{\sqrt{1-x^2}}dx = -3\int \frac{-x^2+1-1}{\sqrt{1-x^2}}dx = -3\left[\int \sqrt{1-x^2}\,dx - \int \frac{dx}{\sqrt{1-x^2}}\right]$$

$$\int \sqrt{1-x^2}\,dx = x\sqrt{1-x^2} + \int \frac{x^2}{\sqrt{1-x^2}}dx$$

$$\int \frac{x^2}{\sqrt{1-x^2}}dx = -\left[x\sqrt{1-x^2} + \int\frac{x^2}{\sqrt{1-x^2}}dx - \int\frac{dx}{\sqrt{1-x^2}}\right] = -x\sqrt{1-x^2} - \int\frac{x^2}{\sqrt{1-x^2}}dx - \quad \arcsin x \Rightarrow$$

$$2\int\frac{x^2}{\sqrt{1-x^2}}dx = -x\sqrt{1-x^2} - \quad \arcsin x + k \Rightarrow \int\frac{x^2}{\sqrt{1-x^2}}dx = \frac{-x\sqrt{1-x^2} - \quad \arcsin x}{2} + k$$

$$\int\frac{3x^2}{\sqrt{1-x^2}}dx = -\frac{3}{2}\left(x\sqrt{1-x^2} + \quad \arcsin x\right) + k$$

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I) $\int \frac{1}{x^2\sqrt[4]{x}}\,dx = \int x^{-\frac{9}{4}}\,dx = \left(-\frac{9}{4}+1\right)x^{\left(-\frac{9}{4}+1\right)} = \frac{5}{4x^{\frac{5}{4}}} = \frac{5}{4x\sqrt[4]{x}}$

Era alla terza!

$-\frac{4}{5}$

II) $\int \frac{\cos\sqrt[3]{x}}{\sqrt[3]{x^2}}\,dx = \int \frac{\cos x^{\frac{1}{3}}}{x^{\frac{2}{3}}} = \int \cos x^{\frac{1}{3}} \cdot x^{-\frac{2}{3}} = 3\int \cos x^{\frac{1}{3}} \cdot x^{-\frac{2}{3}} \cdot \frac{1}{3} = 3\sin\sqrt[3]{x} + c$

Bene!

$f(x)=e^x \quad g'(x)=\cos x$

III) $\int e^x \sin x\,dx = \sin(x)\cdot e^x - \int e^x \cdot \cos x\,dx = \sin x\, e^x - \left(\cos x \cdot e^x - \int e^x \cdot (-\sin x)\,dx\right) =$

$\sin x\, e^x - \cos x\, e^x + \int e^x \sin x\,dx = \int e^x \sin x\,dx$

$\sin x\, e^x - \cos x\, e^x + C = 2\int e^x \sin x\,dx$

$\int e^x \sin x\,dx = \frac{\sin x\, e^x - \cos x\, e^x}{2} + c$

Bene!

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GRIGLIA DI VALUTAZIONE

	COEFFICIENTE MOLTIPLICATIVO (CM)						PUNTEGGIO ESERCIZIO	VALUTAZIONE
	0	0.2	0.4	0.6	0.8	1		
$\int \frac{1}{x^2 \cdot \sqrt[4]{x^3}}\, dx$				X			14	8,4
$\int \frac{3x^2}{\sqrt{1-x^2}}\, dx$			X				14	5,6
$\int \frac{\cos \sqrt[3]{x}}{\sqrt[3]{x^2}}\, dx$						X	14	14
$\int \frac{2x^2}{4-x^3}\, dx$						X	14	14
$\int e^x \sin x\, dx$						X	14	14
$\int \cos^2 x\, dx$					X		14	11,2
$\int \arctan x\, dx$						X	16	16
							TOT	83,2
							VOTO FINALE	8,5