INTEGRALI

24 mar 21

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

$$= 4\ln(1+\sqrt{x}) + K$$

$$\to \int e^{-x}\,dx = -e^{-x} + K$$

$$\to \int e^{x^2}\cdot x\,dx = \frac{1}{2}\int e^{x^2}\cdot 2x\,dx = \frac{1}{2}e^{x^2} + K$$

$$\to \int 2x\cos x^2\,dx = \operatorname{sen} x^2 + K$$

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$$\rightarrow \int \frac{1}{x \cos^2 \ln x} \, dx = \int \cos^{-2}(\ln x) \cdot D(\ln x) \, dx =$$

$$= \tan \ln x + k$$

□

$$\rightarrow \int \frac{1 + \operatorname{sen}^3 x}{\operatorname{sen}^2 2x} \, dx = \int \left[\frac{1}{\operatorname{sen}^2 2x} + \frac{\operatorname{sen}^3 x}{\operatorname{sen}^2 2x} \right] dx =$$

$$= \frac{1}{2} \int \operatorname{sen}^{-2}(2x) \cdot 2 \, dx + \int \frac{\operatorname{sen}^3 x}{4 \operatorname{sen}^2 x \cos^2 x} \, dx =$$

$$= -\frac{1}{2} \operatorname{cotan}(2x) + k - \frac{1}{4} \cdot \int \frac{-\operatorname{sen} x}{\cos^2 x} \, dx =$$

$$= -\frac{1}{2} \operatorname{cotan} 2x - \frac{1}{4} \left(-\frac{1}{\cos x} \right) + k = -\frac{1}{2} \operatorname{cotan} x + \frac{1}{4 \cos x} + k$$

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$$\rightarrow \int \frac{2}{1+4x^2}\,dx = \int \frac{1}{1+(2x)^2}\cdot 2\,dx = \text{arctan } 2x + K \qquad \square$$

$$\rightarrow \int \frac{x}{1+x^4}\,dx = \frac{1}{2}\int 2x\cdot\frac{1}{1+(x^2)^2} = \frac{1}{2}\,\text{arctan } x^2 + K \qquad \square$$

$$\rightarrow \int \frac{1}{\sqrt{9-25x^2}}\,dx = \frac{1}{3}\int \frac{1}{\sqrt{1-\left(\frac{5}{3}x\right)^2}}\,dx = \frac{1}{5}\int \frac{1}{\sqrt{1-\left(\frac{5}{3}x\right)^2}}\cdot\frac{5}{3}\,dx =$$

$$= \frac{1}{5}\,\text{arcsen } x + K \qquad \square$$

$$\rightarrow \int \frac{1}{\sqrt{x}+x\sqrt{x}}\,dx = \int \frac{1}{\sqrt{x}}\cdot\frac{1}{(\sqrt{x})^2+1}\,dx = 2\int \frac{1}{2\sqrt{x}}\cdot\frac{1}{1+(\sqrt{x})^2}\,dx =$$

$$= 2\,\text{arctan}\sqrt{x} + K \qquad \square$$

$\rightarrow \displaystyle\int \frac{2}{9+4x^2}\,dx = \frac{1}{3}\int \frac{2}{3}\cdot\frac{1}{\left[1+\left(\frac{2}{3}x\right)^2\right]} = \frac{1}{3}\arctan\left(\frac{2}{3}x\right)+K$ $\square$

$\rightarrow \displaystyle\int \frac{2x}{9+4x^2}\,dx = \frac{1}{4}\int \left(4x^2+9\right)^{-1}\cdot 8x\,dx =$

$\displaystyle = \frac{1}{4}\ln\left(4x^2+9\right)+K$ $\square$