Calcular 
$$\int_0^1 \frac{y^2}{\sqrt{4-3y}} dy.$$

Resolução:

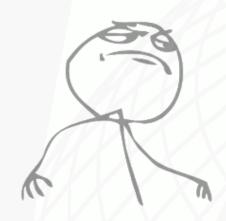
Seja 
$$I = \int \frac{y^2}{\sqrt{4-3y}} dy$$
.

Aplicando "por partes":

$$I = \frac{-2\sqrt{4 - 3y} \cdot y^2}{3} + \frac{4}{3} \int y\sqrt{4 - 3y} \ dy$$

Aplicando "por partes" novamente:

$$\begin{split} I &= \frac{-2\sqrt{4-3y} \cdot y^2}{3} - \frac{8}{27} \sqrt{(4-3y)^3} \cdot y - \frac{16}{405} \sqrt{(4-3y)^5} + c \\ &\int_0^1 \frac{y^2}{\sqrt{4-3y}} dy = \left[ \frac{-2\sqrt{4-3y} \cdot y^2}{3} - \frac{8}{27} \sqrt{(4-3y)^3} \cdot y - \frac{16}{405} \sqrt{(4-3y)^5} \right] \Big|_0^1 = \\ &= -\frac{2}{3} - \frac{8}{27} - \frac{16}{405} + \frac{512}{405} = \boxed{\frac{106}{405}} \end{split}$$



Documento compilado em Thursday 13<sup>th</sup> March, 2025, 20:22, tempo no servidor.

 $\'ultima vers\~ao do documento (podem haver correç\~oes e/ou aprimoramentos): "bit.ly/mathematicalramblings\_public".$ 

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