

$$\int x \operatorname{arctg} x \, dx =$$

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- PER PARTI

$$\begin{aligned} &= [Sx] \operatorname{arctg} x - \int [Sx] [D \operatorname{arctg} x] \, dx = \\ &= \frac{1}{2} x^2 \operatorname{arctg} x - \int \frac{1}{2} x^2 \frac{1}{1+x^2} \, dx = \\ &= \frac{1}{2} x^2 \operatorname{arctg} x - \frac{1}{2} \int \frac{x^2}{1+x^2} \, dx = \\ &= \frac{1}{2} x^2 \operatorname{arctg} x - \frac{1}{2} \int \frac{x^2+1-1}{1+x^2} \, dx = \\ &= \frac{1}{2} x^2 \operatorname{arctg} x - \frac{1}{2} \int \frac{\cancel{x^2+1}}{1+x^2} - \frac{1}{1+x^2} \, dx = \\ &= \frac{1}{2} x^2 \operatorname{arctg} x - \frac{1}{2} \int 1 \, dx + \frac{1}{2} \int \frac{1}{1+x^2} \, dx = \\ &= \boxed{\frac{1}{2} x^2 \operatorname{arctg} x - \frac{1}{2} x + \frac{1}{2} \operatorname{arctg} x + K} \end{aligned}$$