k) $\int \frac{1+\cos(x)}{\underbrace{x+\operatorname{sen}(x)}_{f(x)}}\,dx = \ln|x+\operatorname{sen}(x)|+C,\ C\in\mathbb{R}$!! $\int f g'\,dx = f(x)g(x) - \int f'(x)g(x)\,dx$

$$(x+\operatorname{sen}(x))' = x' + \operatorname{sen}(x)' = 1+\cos(x)$$

l) $$\int \frac{e^{2x+1}}{e^{2x}+3}\,dx = \int \frac{e^{\ln(u)+1}}{(u+3)(2u)}\,du = \frac{1}{2}\int \frac{e^{\ln(u)}\cdot e}{(u+3)\,u} = \frac{e}{2}\int \frac{\cancel{u}}{(u+3)\cancel{u}}\,du =$$

Subst:

$u = e^{2x}$

$2x = \ln(u)$

$x = \frac{\ln(u)}{2}$

$x' = \left(\frac{1}{2}(\ln(u))\right)' = \frac{1}{2}(\ln(u)-1)' = \frac{1\cdot 1}{2\cdot u}$

$$= \frac{e}{2}\int \frac{1}{(u+3)} = \frac{e}{2}\ln|e^{2x}+3|+C,\ C\in\mathbb{R}$$

$\int f(x) g'(x)\, dx = f(x)g(x) - \int f'(x) g(x)\, dx$

mm) $\frac{1}{6}\int \underbrace{6x^5}_{f'(x)} \operatorname{sen}(\underbrace{x^6}_{f(x)}) = -\frac{1}{6}\cos(x^6) + C, C\in\mathbb{R}$

c. aux.

$(x^6)' = 6x^5$

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m) $\int \frac{\arccos(x) - x}{\sqrt{1-x^2}} = \int \frac{u - \cos(u)}{\sqrt{1-(\cos(u))^2}} \cdot -\operatorname{sen}(u) \int \frac{u - \cos(u)}{\sqrt{\operatorname{sen}^2(u)}} \times -\operatorname{sen}(u)\, du =$

subs:

$u = \arccos(x)$

$x = \cos(u)$

$\cos^2(x) + \sin^2(x) = 1$

$\sin^2(x) = 1 - \cos^2(x)$

$x' = (\cos(u))' = -\operatorname{sen}(u)$

$= \int \frac{-u - \cos(u)}{\cancel{\operatorname{sen}(u)}} \cdot \cancel{\operatorname{sen}(u)}\, du = \int -u + \cos u\, dx =$

$= -\int u\, du + \int \cos(u)\, du = -\frac{u^2}{2} + \operatorname{sen}(u) + C, C\in\mathbb{R} =$

$= -\frac{\arccos^2(x)}{2} + \operatorname{sen}(\arccos(x)) + C, C\in\mathbb{R}$

$$01)\ \frac{1}{2}\int \frac{\cos(\ln(x^2))\cdot 2}{x}\,dx = \frac{1}{2}\operatorname{sen}(\ln(x^2)) + C,\ C\in\mathbb{R}$$

$$(\ln(x^2))' = \frac{(x^2)'}{x^2} = \frac{2x}{x^2} = \frac{2}{x}$$