$$\sec^2 x = (tg\, x)'$$
$$\sec x \cdot tg\, x = (\sec x)'$$
$$\sec x + tg\, x = (\,?\,)'$$
$\hookrightarrow$ substitui

$$\int \frac{\sec^2 x + \sec x \cdot tg\, x}{\sec x + tg\, x} \cdot dx = \int \frac{1}{u} \cdot du = \ln|u| + c = \boxed{\ln|\sec x + tg\, x| + c}$$

$$u = \sec x + tg\, x$$
$$du = \sec x \cdot tg\, x + \sec^2 x \cdot dx$$

$$\int \frac{\sec^2 x + \sec x \cdot tg\, x}{\sec x + tg\, x} \cdot dx = \int 1 \cdot \sec x \cdot dx = x \cdot \sec x - \int \sec x \cdot tg\, x \cdot x \cdot dx$$

$f = \sec x \rightarrow f' = \sec x \cdot tg\, x$

$g' = 1 \qquad g = x$

$$\left(\frac{1}{\cos^2 x} + \frac{1}{\cos x} \cdot \frac{\operatorname{sen} x}{\cos x}\right) \frac{1}{\cos x} + \frac{\operatorname{sen} x}{\cos x}$$

$$\left(\frac{1}{\cos^2 x} + \frac{\operatorname{sen} x}{\cos^2 x}\right) \frac{1 + \operatorname{sen} x}{\cos x}$$

$$\left(\frac{1 + \operatorname{sen}}{\cos^2 x}\right) \frac{1 + \operatorname{sen} x}{\cos x}$$

$$\frac{1 + \operatorname{sen}^2}{\cos^3 x} = \frac{\cos^2 x}{\cos^3 x} = \frac{1}{\cos x} = \sec x$$

Integral cíclica $\rightarrow$ Por partes

$$\int e^x \cdot \operatorname{sen} x \cdot dx = \boxed{e^x \cdot \operatorname{sen} x - \int e^x \cdot \cos x \cdot dx}$$

$f = \operatorname{sen} x \rightarrow f' = \cos x$

$g' = e^x \qquad g = e^x$

$$\int e^x \cdot \cos x \, dx = e^x \cdot \cos x - \int e^x \cdot (-\operatorname{sen} x) = \boxed{e^x \cdot \cos x + \int e^x \cdot \operatorname{sen} x \cdot dx}$$

$f = \cos x \rightarrow f' = -\operatorname{sen} x$

$g' = e^x \qquad g = e^x$

$$\int e^x \cdot \operatorname{sen} x \cdot dx = e^x \cdot \operatorname{sen} x - \int e^x \cdot \cos x \cdot dx$$

$$\int e^x \cdot \operatorname{sen} x \cdot dx = e^x \cdot \operatorname{sen} x - \left(e^x \cdot \cos x + \int e^x \cdot \operatorname{sen} x \cdot dx\right)$$

$$\int e^x \cdot \operatorname{sen} x \cdot dx = e^x \cdot \operatorname{sen} x - e^x \cdot \cos x - \int e^x \cdot \operatorname{sen} x \cdot dx$$

$$2 \int e^x \cdot \operatorname{sen} x \cdot dx = e^x \cdot \operatorname{sen} x - e^x \cdot \cos x$$

$$\boxed{\int e^x \cdot \operatorname{sen} x \cdot dx = \frac{e^x \cdot \operatorname{sen} x - e^x \cdot \cos x}{2}}$$

$$\frac{10-2x}{x^2-5x} = \frac{A}{x} + \frac{B}{x+5} = A(x+5) + B(x)$$

$$A(x+5) + B(x) = 10 - 2x$$

$$x = -5 = B(-5) = \underbrace{10 - \underbrace{(2 \cdot -5)}_{-10}}_{10+10} \Rightarrow -5 \cdot B = 20 \rightarrow B = -4$$

$$X = 0 \longrightarrow A(5) = 10 - (2 \cdot 0) = A = 10/5 = \boxed{A = 2}$$

$$\int \frac{\sqrt{\ln x}}{x^2} \cdot dx$$