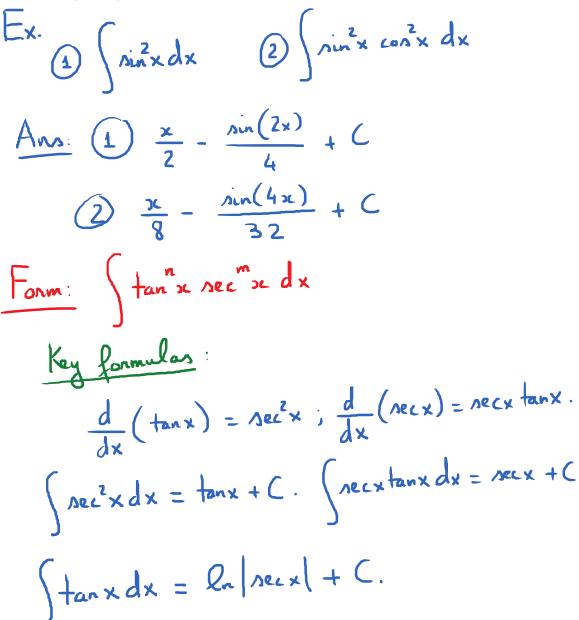
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Secx dx = ln secx + tanx + C

+
$$\tan^2 x = \sec^2 x$$

 $\tan^2 x = \sec^2 x - 1$

Case 1: m, the power of secant, is even.
E.g.
$$\int tan^{6}x \cdot \sec^{4}x \, dx$$

let $u = tan x$; $du = sec^{2}x \, dx$
 $\int tan^{6}x \cdot sec^{2}x \, dx$
 $\int u^{6}(1 + u^{2}) \, du = \int (u^{6} + u^{8}) \, du$
 $= \frac{u^{2}}{7} + \frac{u^{9}}{9} + C = \frac{\tan^{7}x}{7} + \frac{\tan^{9}x}{9} + C$

Strategy for power of recart in even. Thursday, February 15, 2018 (1) Save a factor noix dx (2) u=tanx (ase 2: n, the power of tangent is odd and m≥1. E.g. $\int tan x sec x dx$ $(u^2-1)^2 = u^6$ = (tan x sec x) (sec x tan x dx) let u = secx; du = secxtanx dx $\tan^2 x = \sec^2 x - 1$. $\tan^4 x = (\tan^2 x)^2$ $= \int (u^{2} - 1)^{2} u^{6} du = \int (u^{4} - 2u^{2} + 1) u^{6} du$ $= \int \left(u^{10} - 2u^8 + u^6 \right) du = \frac{u^{11}}{11} - 2\frac{u^9}{9} + \frac{u^7}{7} + C$

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Strategn: power of trangent in edd, har at least
a secont factor.
(1) Save a factor of secritarix dx
(2) let u = secx.
(are 3: Neither 1 nor 2.
This could require a variety of trules:
like integrations by ports, substitution,
trig identities, etc.
E.g. [secxdx.
Hint: Integration by parts.
$$U = secx$$

 $dv = sec^{2}x dx$

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Form:
$$\int \sin(nx) \cos(mx) dx$$

$$\int \sin(nx) \sin(mx) dx$$

$$\int \cos(nx) \cos(mx) dx$$

Strategy: Broduct-to - Sum Identitien.
Ain A con B = $\frac{1}{2} \left[\sin(A-B) + \sin(A+B) \right]$
Ain A sin B = $\frac{1}{2} \left[\cos(A-B) - \cos(A+B) \right]$
 $\cos A \cos B = \frac{1}{2} \left[\cos(A-B) + \cos(A+B) \right]$
 $\cos A \cos B = \frac{1}{2} \left[\cos(A-B) + \cos(A+B) \right]$
Eq. $\int \cos(6x) \cos(3x) dx$
$$= \int \frac{1}{2} \left[\cos(3x) + \cos(9x) \right] dx$$

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 $\frac{1}{2} \int \left(\cos(3x) + \cos(9x) \right) dx$ $\frac{\sin(3x)}{3} + \frac{\sin(9x)}{9}$ C $=\frac{1}{2}$ $\frac{\sin(3x)}{6} + \frac{\sin(9x)}{18}$