

$$\int \sec^2(ax + b)dx = \frac{\tan(ax + b)}{a} + C$$

Tips:

1. Integrating $\sec^2(x)$ gives a $\tan x$ graph
2. When integrating trig, always think of double angle formulas!

$$\cdot \int 2 \sin x \cos x dx = \int \sin 2x dx$$

$$\cdot \int \cos(2x) dx = \cos^2 x - \sin^2 x$$

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

$$\cdot \int \cos(2x) dx = 2 \cos^2 x - 1$$

3. Remember trig identities

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\tan^2 \theta + 1 = \sec^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

4. Change $\int \tan x \rightarrow \int \sin x / \cos x = -\ln(\cos x) + C$
Change $\int \cot x \rightarrow \int \cos x / \sin x = \ln(\sin x) + C$

12.1 WORKED EXAMPLE

$$\int \sec^2(5x) dx$$

12.2 WORKED EXAMPLE

$$\int 1 - \tan^2 2x dx$$