If Antiderivative is Known

$F(x) = x^2$ is an antiderivative of $f(x) = 2x$

$$F'(x) = \frac{d}{dx}[x^2]$$

$$=$$

$$2x^{2-1}$$

$$=$$

$$\boxed{\begin{aligned} F'(x) &= 2x \\ &= \\ f(x) &= 2x \end{aligned}}$$

$F(x) = x^2 + 1$ is ~~the~~ an antiderivative of $f(x) = 2x$

$$F'(x) = \frac{d}{dx} x^2 + 1$$

$$=$$

$$\frac{d}{dx}[x^2] + \frac{d}{dx}[1]$$

$$=$$

$$2x^{2-1} + 0$$

$$=$$

$$\boxed{\begin{aligned} F'(x) &= 2x \\ &= \\ f(x) &= 2x \end{aligned}}$$

Get antiderivative of $F'(x) = x^2 + C$ for any real number C.

$$F(x) = x^2 + C$$

$$=$$

$$\frac{d}{dx}[x^2 + C]$$

$$=$$

$$\frac{d}{dx}[x^2] + \frac{d}{dx}[C]$$

$$=$$

$$2x^{2-1} + 0$$

$$=$$

$$\boxed{F'(x) = 2x}$$

Get antiderivative of $F'(x) = \tan(x)$

$$F'(x) = \tan(x)$$

$$=$$

$$\frac{d}{dx}[\tan(x)]$$

$$=$$

$$\boxed{\begin{gathered} F'(x) = \sec^2(x) \\ = \\ f(x) = \sec^2(x) \end{gathered}}$$

Get antiderivative of $F'(x) = \tan(x) + C$

$$=$$

$$\frac{d}{dx}[\tan(x) + C]$$

$$=$$

$$\frac{d}{dx}[\tan(x)] + \frac{d}{dx}[C]$$

$$=$$

$$\sec^2(x) + 0$$

$$\boxed{\begin{gathered} F'(x) = \sec^2(x) \\ = \\ f(x) = \sec^2(x) \end{gathered}}$$

Get the antiderivative of $f(x) = \sin(x)$

Use $\cos(x)$

$$F'(x) = \frac{d}{dx} -1 \cdot \cos(x)$$

$$=$$

$$-1 \frac{d}{dx} [\cos(x)]$$

$$=$$

$$-1 \cdot -\sin(x)$$

$$=$$

$$\sin(x)$$

For Now Use an online Antiderivative Calculator to Get the Antiderivative.

$$f'(x) = \frac{d}{dx} [\sin(x)]$$

$$=$$

$$\boxed{f'(x) = \cos(x)}$$

$$f'(x) = \frac{d}{dx}\, 2 \cdot \sec(x) \cdot \tan(x)$$

$$=$$

$$2 \cdot \frac{d}{dx} [\sec(x)\ \tan(x)]$$

$$=$$

$$2 \cdot \sec(x) \cdot \frac{d}{dx} [\tan(x)]$$

$$=$$

$$2 \sec(x) \sec^2(x)$$