Simplifying some integrals

A lot of these integrals are very long. Some substitutions can be done in your head. Let’s say $F(x)$ is an antiderivative of $f(x)$. Then $\int f(ax + b) \, dx = \frac{1}{a} F(ax + b) + C$ when $a$ and $b$ are constants. So if $f(x)$ is a standard function (whose antiderivative you know), then this is useful if integrating $f(ax + b)$.

Examples:

\[
\begin{align*}
\int \cos(3x + 4) \, dx &= \frac{1}{3} \sin(3x + 4) + C \\
\int \sin(x + 5) \, dx &= -\cos(x + 5) + C \\
\int \sec^2(6x) \, dx &= \frac{1}{6} \tan(6x) + C \\
\int e^{3x+4} \, dx &= \frac{1}{3} e^{3x+4} + C \\
\int e^{5-x} \, dx &= -e^{5-x} + C \\
\int \frac{1}{3x+4} \, dx &= \frac{1}{3} \ln(|3x + 4|) + C \\
\int \frac{5}{x+7} \, dx &= 5 \ln(|x + 7|) + C.
\end{align*}
\]

DO NOT OVER USE THIS!

This does not apply to $\int \cos(x^2) \, dx$. 