1.)   Verify that $\frac{1}{2}\sin 2x + 30$ is an antiderivative of $\cos 2x$.

2.)   Verify that $\frac{1}{8}\tan 8x + 4\sec 5x - 3$ is an antiderivative of $\sec^2 8x + 20\sec 5x \tan 5x$.

3.)   Evaluate $\int \sin 9x \, dx$ and check your result by differentiation.

4.)   Give a general formula for $\int \sin kx \, dx$, where k is a constant.

5.)   Verify that $e^x \cos x$ is an antiderivative for $e^x \cos x - e^x \sin x$.

6.)   Find an antiderivative for $x^2 \cos x + 2x \sin x$.