Example 1: Find the area underneath the graph of $g(x) = \frac{3}{x} + \sin(x)$ between $x = 1$ and $x = \frac{3\pi}{4}$

$$
\begin{aligned}
g(x) &= \frac{3}{x} + \sin(x) \\
\int_1^{\frac{3\pi}{4}} g(x)\,dx &= \int_1^{\frac{3\pi}{4}} \quad dx \\
\int_1^{\frac{3\pi}{4}} g(x)\,dx &= \int_1^{\frac{3\pi}{4}} \frac{3}{x}\,dx + \int_1^{\frac{3\pi}{4}} \sin(x)dx \\
\int_1^{\frac{3\pi}{4}} g(x)\,dx &= 3\int_1^{\frac{3\pi}{4}} \frac{1}{x}\,dx + \int_1^{\frac{3\pi}{4}} \sin(x)dx \\
\int_1^{\frac{3\pi}{4}} g(x)\,dx &= 3\ln(x)]_1^{\frac{3\pi}{4}} - \cos(x)]_1^{\frac{3\pi}{4}} \\
\int_1^{\frac{3\pi}{4}} g(x)\,dx &= 3\left(\frac{3\pi}{4}\right) - 3\ln(1) - \cos\left(\frac{3\pi}{4}\right) + \cos(1) \\
\int_1^{\frac{3\pi}{4}} g(x)\,dx &= 3\ln\left(\frac{3\pi}{4}\right) + \frac{\sqrt{2}}{2} + \cos(1)
\end{aligned}
$$

It is not a fully simplified answer, but there is no need to fully evaluate it as there is nothing but pre-calculus left. This answer is good enough.

Example 2: Find the area underneath the graph of $f(x) = 3x^2 - 2\cos(x)$ between $x = 2$ and $x = 5$

$$
\begin{aligned}
f(x) &= 3x^2 - 2\cos(x) \\
\int_2^5 f(x)\,dx &= \int_2^5 3x^2 - 2\cos(x)\,dx \\
\int_2^5 f(x)\,dx &= \int_2^5 3x^2\,dx - \int_2^5 2\cos(x)\,dx \\
\int_2^5 f(x)\,dx &= \int_2^5 3x^2\,dx - 2\int_2^5 \cos(x)\,dx \\
\int_2^5 f(x)\,dx &= \left(\frac{1}{3} * 3x^{2+1}\right)]_2^5 - 2(\sin(x))]_2^5 \\
\int_2^5 f(x)\,dx &= x^3]_2^5 - 2\sin(x)]_2^5 \\
\int_2^5 f(x)\,dx &= (125 - 8) - 2\sin(5) + 2\sin(2) \\
\int_2^5 f(x)\,dx &= 117 + 2\sin(2) - 2\sin(5)
\end{aligned}
$$