

Exercise 1. Consider the following expressions: $\sqrt{4+9y^2}$ and $\frac{16}{\sqrt{4t^2-9}}$. What are the trigonometric substitutions required to simplify each of the expressions?

Exercise 2. Find an anti-derivative of $\sin^3(t)\cos(t)$.

Exercise 3. Manipulate the expression $\tan^6(r)\sec^4(r)$ in order to find an antiderivative of this function.

Exercise 4. Evaluate the integral $\int \frac{dx}{\sqrt{(2x-1)^2-4}}$. *Your answer must be a function depending on x .* [It is helpful to know that an anti-derivative of $\sec(\theta)$ is $\log(\sec(\theta)+\tan(\theta))$.]