**Example** Find the indefinite integral:$\int \sqrt{x} + \frac{1}{\sqrt{x}}$

$$\begin{aligned}\int \sqrt{x} + \frac{1}{\sqrt{x}}\,dx &= \int \sqrt{x}\,dx + \int \frac{1}{\sqrt{x}}\,dx \\ &= \int x^{1/2}\,dx + \int x^{-1/2}\,dx \\ &= \frac{x^{3/2}}{3/2} + \frac{x^{1/2}}{1/2} + C \\ &= \frac{2}{3}x^{3/2} + 2x^{1/2} + C\end{aligned}$$

**Example** Find the indefinite integral:$\int (\theta^2 + \sec^2\theta)\,d\theta$

$$\begin{aligned}\int (\theta^2 + \sec^2\theta)\,d\theta &= \int \theta^2\,d\theta + \int \sec^2\theta\,d\theta \\ &= \frac{\theta^3}{3} + \tan\theta + C\end{aligned}$$

**Example** Find the indefinite integral: $\int \frac{\cos\theta}{1-\cos^2\theta}\,d\theta$
Since the only rules we have seen so far are only the formulas provided above and the two properties we got from the last theorem our current knowledge is not enough to calculate the integral as it is. So we need to re-write the integrand by using trig identities in a different way that will hopefully help us. Recall $1 - \cos^2\theta = \sin^2\theta$ so plug this in the denominator

$$\begin{aligned}\int \frac{\cos\theta}{1-\cos^2\theta}\,d\theta &= \int \frac{\cos\theta}{\sin^2\theta}\,d\theta \\ &= \int \frac{1}{\sin\theta}\frac{\cos\theta}{\sin\theta}\,d\theta \\ &= \int \csc\theta\cot\theta\,d\theta \\ &= -\csc\theta + C\end{aligned}$$