

STEP/Integration Q8 (21/6/23)

$$\int \sec^4 \theta \, d\theta$$

Solution

$$\int \sec^4 \theta \, d\theta = \int \sec^2 \theta (1 + \tan^2 \theta) \, d\theta$$

[Spotting that $\int \sec^2 \theta \, d\theta = \tan \theta$] Let $u = \tan \theta$,

so that $du = \sec^2 \theta \, d\theta$, and $\int \sec^4 \theta \, d\theta = \int 1 + u^2 \, du$ etc