InTRIGuing Integrals

Use substitution and trig identities to compute the following integrals.

1. $\int \left(\sin^4 x\right) \cos^3 x \, dx$ *Hint:* $\sin^2\theta + \cos^2\theta = 1$.

2. $\int \tan^6\theta \sec^4\theta \, d\theta$. *Hint:* $\sec^4\theta = \sec^2\theta \sec^2\theta$.

3. $\int \cos^3\theta \, d\theta$ *Hint: Rewrite the integrand using* $\sin^2\theta + \cos^2\theta = 1$ *before substituting.*