



■ 1 $\frac{1}{\cos^2 \theta} = 1 + \tan^2 \theta$ であるから, $\cos^2 \theta = \frac{1}{1 + \tan^2 \theta}$

$$\begin{aligned}(1 - \tan^4 \theta) \cos^2 \theta + \tan^2 \theta &= (1 - \tan^2 \theta)(1 + \tan^2 \theta) \cdot \frac{1}{1 + \tan^2 \theta} + \tan^2 \theta \\ &= 1 - \tan^2 \theta + \tan^2 \theta \\ &= 1\end{aligned}$$

■ 2(1) $\sin \theta + \cos \theta = \frac{1}{3}$ の両辺を 2 乗すると

$$\sin^2 \theta + 2 \sin \theta \cos \theta + \cos^2 \theta = \frac{1}{9}$$

$$1 + 2 \sin \theta \cos \theta = \frac{1}{9} \quad \therefore \sin \theta \cos \theta = -\frac{4}{9}$$

(2) $\sin^3 \theta + \cos^3 \theta = (\sin \theta + \cos \theta)^3 - 3 \sin \theta \cos \theta (\sin \theta + \cos \theta) = \left(\frac{1}{3}\right)^3 - 3 \cdot \left(-\frac{4}{9}\right) \cdot \frac{1}{3} = \frac{13}{27}$