



三角関数6

$2 + \sin^2 \theta = 7 \cos \theta \sin \theta$ が成り立つとき, $\tan \theta$ の値を求めよ。

[東京電機大]

両辺 $\cos^2 \theta$ で割ると

$$\frac{2}{\cos^2 \theta} + \frac{\sin^2 \theta}{\cos^2 \theta} = \frac{7 \sin \theta}{\cos \theta} \dots ①$$

$$\tan^2 \theta = \frac{\sin^2 \theta}{\cos^2 \theta} = \frac{1 - \cos^2 \theta}{\cos^2 \theta} = \frac{1}{\cos^2 \theta} - 1$$

① $\frac{1}{\cos^2 \theta} = \tan^2 \theta + 1$ とおき、①の左辺に $\tan \theta$ を用いて表すと

$$2(\tan^2 \theta + 1) + \tan^2 \theta = 7 \tan \theta$$

$$3 \tan^2 \theta - 7 \tan \theta + 2 = 0$$

$$(3 \tan \theta - 1)(\tan \theta - 2) = 0$$

∴ $\tan \theta = 2$ または $\frac{1}{3}$

