

2014年 歯・薬学部 (中期) 第2問



$$\boxed{2} \quad \sin \theta + \cos \theta = \frac{1}{\sqrt{2}} \text{ のとき}$$

$$(1) \quad \sin \theta \cos \theta = \frac{\boxed{\text{アイ}}^{-1}}{\boxed{\text{ウ}}^4} \text{ である.}$$

$$(2) \quad \sin^3 \theta + \cos^3 \theta = \frac{\boxed{\text{エ}}^5 \sqrt{\boxed{\text{オ}}^2}}{\boxed{\text{カ}}^8} \text{ である.}$$

$$(3) \quad \sin^4 \theta + \cos^4 \theta = \frac{\boxed{\text{キ}}^7}{\boxed{\text{ク}}^8} \text{ である.}$$

$$(1) \quad \sin \theta + \cos \theta = \frac{1}{\sqrt{2}} \text{ の両辺を2乗して,}$$

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

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

$$\therefore \underline{\sin \theta \cos \theta = -\frac{1}{4}} \text{ ,,}$$

$$(2) \quad \sin^3 \theta + \cos^3 \theta = (\sin \theta + \cos \theta)(\sin^2 \theta - \sin \theta \cos \theta + \cos^2 \theta)$$

$$= \frac{1}{\sqrt{2}} \cdot \left(1 + \frac{1}{4}\right)$$

$$= \underline{\frac{5\sqrt{2}}{8}} \text{ ,,}$$

$$(3) \quad \sin^4 \theta + \cos^4 \theta = (\sin^2 \theta + \cos^2 \theta)^2 - 2(\sin \theta \cos \theta)^2$$

$$= 1^2 - 2 \cdot \left(-\frac{1}{4}\right)^2$$

$$= \underline{\frac{7}{8}} \text{ ,,}$$