

2010年3科型第17問


 数理
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17 $0 < \theta < \frac{\pi}{2}$, $\sin \theta \cos \theta = \frac{1}{8}$ のとき, 次の値を求めよ.

(1) $\sin \theta + \cos \theta = \square$ $\frac{\sqrt{5}}{2}$

(2) $\sin^3 \theta + \cos^3 \theta = \square$ $\frac{7\sqrt{5}}{16}$

$$(1) (\sin \theta + \cos \theta)^2 = \sin^2 \theta + 2 \sin \theta \cos \theta + \cos^2 \theta$$

$$= 1 + 2 \cdot \frac{1}{8}$$

$$= \frac{5}{4}$$

$$0 < \theta < \frac{\pi}{2} \text{ より } \sin \theta + \cos \theta > 0 \quad \therefore \sin \theta + \cos \theta = \frac{\sqrt{5}}{2} //$$

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

$$= \left(\frac{\sqrt{5}}{2}\right)^3 - 3 \cdot \frac{1}{8} \cdot \frac{\sqrt{5}}{2}$$

$$= \frac{5\sqrt{5}}{8} - \frac{3\sqrt{5}}{16}$$

$$= \frac{7\sqrt{5}}{16} //$$