第 17 回　解答 (工科系数学 I 及び演習)

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1. 次の角を弧度法で表しなさい.

1. $30° = \dfrac{1}{6}\pi$

2. $135° = \dfrac{3}{4}\pi$

3. $180° = \pi$

4. $120° = \dfrac{2}{3}\pi$

5. $-90° = -\dfrac{1}{2}\pi$

6. $-225° = -\dfrac{5}{4}\pi$

2. 次の角を度数法で表しなさい.

1. $\dfrac{1}{3}\pi = 60°$

2. $\dfrac{3}{4}\pi = 135°$

3. $\dfrac{3}{2}\pi = 270°$

4. $\dfrac{5}{6}\pi = 150°$

5. $-\dfrac{1}{4}\pi = -45°$

6. $-2\pi = -360°$

3. 次の三角関数の値を求めなさい.

1. $\sin 135° = \dfrac{1}{\sqrt{2}}$

2. $\cos(-30°) = \dfrac{\sqrt{3}}{2}$

3. $\tan 60° = \sqrt{3}$

4. $\sin 0 = 0$

5. $\cos \dfrac{1}{3}\pi = \dfrac{1}{2}$

6. $\tan \dfrac{1}{4}\pi = 1$

7. $\sin \dfrac{3}{4}\pi = \dfrac{1}{\sqrt{2}}$

8. $\sin\left(-\dfrac{3}{2}\pi\right) = 1$

9. $\cos \dfrac{4}{3}\pi = -\dfrac{1}{2}$

10. $\cos\left(-\dfrac{1}{4}\pi\right) = \dfrac{1}{\sqrt{2}}$

11. $\tan \dfrac{2}{3}\pi = -\sqrt{3}$

12. $\tan\left(-\dfrac{1}{6}\pi\right) = -\dfrac{1}{\sqrt{3}}$

4. θ は鋭角 $\left(0 \le \theta \le \dfrac{\pi}{2}\right)$ とする. $\sin\theta = \dfrac{12}{13}$ のとき, $\cos\theta$ の値を求めなさい.

　解答. $\cos^2\theta + \sin^2\theta = 1$ より,

$$\cos^2\theta = 1 - \sin^2\theta = 1 - \left(\frac{12}{13}\right)^2 = 1 - \frac{144}{169} = \frac{25}{169}$$

よって, $\cos\theta = \pm\dfrac{5}{13}$. θ は鋭角なので, $\cos\theta = \dfrac{5}{13}$

5. θ は鈍角 $\left(\dfrac{\pi}{2} \le \theta \le \pi\right)$ とする. $\sin\theta = \dfrac{3}{5}$ のとき, $\cos\theta$ の値を求めなさい.

　解答. $\cos^2\theta + \sin^2\theta = 1$ より,

$$\cos^2\theta = 1 - \sin^2\theta = 1 - \left(\frac{3}{5}\right)^2 = 1 - \frac{9}{25} = \frac{16}{25}$$

よって, $\cos\theta = \pm\dfrac{4}{5}$. θ は鈍角なので, $\cos\theta = -\dfrac{4}{5}$