第5章 3.「弧度法」 第4回

解答

1. (1) $\frac{\pi}{6}$ (2) $\frac{3}{4}\pi$ (3) $\frac{4}{9}\pi$ (4) $\frac{3}{2}\pi$ (5) $-\frac{2}{3}\pi$

2. (1) $60°$ (2) $54°$ (3) $150°$ (4) $300°$ (5) $-45°$

3. (1) 8π cm (2) 24π cm^2

4. (1) $\frac{4}{5}\pi$ (2) 40π cm^2

5. (1) 9 cm (2) 4π cm

解説

1. $\alpha° = \theta$ ラジアン $\Rightarrow \theta = \alpha \times \frac{\pi}{180}$

(1) $30 \times \frac{\pi}{180} = \frac{\pi}{6}$ (2) $135 \times \frac{\pi}{180} = \frac{3}{4}\pi$ (3) $80 \times \frac{\pi}{180} = \frac{4}{9}\pi$

(4) $270 \times \frac{\pi}{180} = \frac{3}{2}\pi$ (5) $-120 \times \frac{\pi}{180} = -\frac{2}{3}\pi$

2. θ ラジアン $= \alpha° \Rightarrow \alpha = \theta \times \frac{180}{\pi}$

(1) $\frac{\pi}{3} \times \frac{180}{\pi} = 60(°)$ (2) $\frac{3}{10}\pi \times \frac{180}{\pi} = 54(°)$ (3) $\frac{5}{6}\pi \times \frac{180}{\pi} = 150(°)$

(4) $\frac{5}{3}\pi \times \frac{180}{\pi} = 300(°)$ (5) $-\frac{\pi}{4} \times \frac{180}{\pi} = -45(°)$

3. 半径 r, 中心角 θ ラジアンの扇形の弧の長さ l, 面積 $S \Rightarrow l = r\theta, S = \frac{1}{2}r^2\theta$

(1) $l = 6 \times \frac{4}{3}\pi = 8\pi(\text{cm})$ (2) $S = \frac{1}{2} \times 6^2 \times \frac{4}{3}\pi = 24\pi(\text{cm}^2)$

4. (1) $l = r\theta$ より $8\pi = 10\theta$. よって $\theta = \frac{8\pi}{10} = \frac{4}{5}\pi$ (2) $S = \frac{1}{2} \times 10^2 \times \frac{4}{5}\pi = 40\pi(\text{cm}^2)$

5. (1) $S = \frac{1}{2}r^2\theta$ より $18\pi = \frac{1}{2} \times r^2 \times \frac{4}{9}\pi$. よって $r^2 = 81$. $r = 9(\text{cm})$

(2) $l = 9 \times \frac{4}{9}\pi = 4\pi(\text{cm})$