第5章 3.「弧度法」 第2回

解答

1. (1) $\frac{5}{6}\pi$ (2) $\frac{5}{18}\pi$ (3) $\frac{\pi}{5}$ (4) $\frac{5}{3}\pi$ (5) $-\frac{\pi}{4}$

2. (1) 90° (2) 60° (3) 108° (4) 330° (5) -100°

3. (1) 6π cm (2) 27π cm^2

4. (1) $\frac{4}{3}\pi$ (2) 24π cm^2

5. (1) 6 cm (2) $\frac{9}{2}\pi$ cm

解説

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

(1) $150 \times \frac{\pi}{180} = \frac{5}{6}\pi$ (2) $50 \times \frac{\pi}{180} = \frac{5}{18}\pi$ (3) $36 \times \frac{\pi}{180} = \frac{\pi}{5}$

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

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

(1) $\frac{\pi}{2} \times \frac{180}{\pi} = 90(^\circ)$ (2) $\frac{\pi}{3} \times \frac{180}{\pi} = 60(^\circ)$ (3) $\frac{3}{5}\pi \times \frac{180}{\pi} = 108(^\circ)$

(4) $\frac{11}{6}\pi \times \frac{180}{\pi} = 330(^\circ)$ (5) $-\frac{5}{9}\pi \times \frac{180}{\pi} = -100(^\circ)$

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) $l = 9 \times \frac{2}{3}\pi = 6\pi(\text{cm})$ (2) $S = \frac{1}{2} \times 9^2 \times \frac{2}{3}\pi = 27\pi(\text{cm}^2)$

4. (1) $l = r\theta$ より $8\pi = 6\theta$. よって $\theta = \frac{8\pi}{6} = \frac{4}{3}\pi$ (2) $S = \frac{1}{2} \times 6^2 \times \frac{4}{3}\pi = 24\pi(\text{cm}^2)$

5. (1) $S = \frac{1}{2}r^2\theta$ より $\frac{27}{2}\pi = \frac{1}{2} \times r^2 \times \frac{3}{4}\pi$ より, $r^2 = 36$. $r = 6(\text{cm})$

(2) $l = 6 \times \frac{3}{4}\pi = \frac{9}{2}\pi(\text{cm})$