第5章 3.「弧度法」 第5回

解答

1. (1) $\frac{\pi}{3}$ (2) $\frac{3}{10}\pi$ (3) $\frac{5}{6}\pi$ (4) $\frac{5}{3}\pi$ (5) $-\frac{\pi}{4}$

2. (1) $120°$ (2) $20°$ (3) $72°$ (4) $330°$ (5) $-90°$

3. (1) 4π cm (2) 20π cm^2

4. (1) $\frac{7}{5}\pi$ (2) $\frac{35}{2}\pi$ cm^2

5. (1) 8 cm (2) 10π cm

解説

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

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

(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 $= \alpha° \Rightarrow \alpha = \theta \times \frac{180}{\pi}$

(1) $\frac{2}{3}\pi \times \frac{180}{\pi} = 120(°)$ (2) $\frac{\pi}{9} \times \frac{180}{\pi} = 20(°)$ (3) $\frac{2}{5}\pi \times \frac{180}{\pi} = 72(°)$

(4) $\frac{11}{6}\pi \times \frac{180}{\pi} = 330(°)$ (5) $-\frac{\pi}{2} \times \frac{180}{\pi} = -90(°)$

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) $l = 10 \times \frac{2}{5}\pi = 4\pi(\text{cm})$ (2) $S = \frac{1}{2} \times 10^2 \times \frac{2}{5}\pi = 20\pi(\text{cm}^2)$

4. (1) $l = r\theta$ より $7\pi = 5\theta$. よって $\theta = \frac{7}{5}\pi$ (2) $S = \frac{1}{2} \times 5^2 \times \frac{7}{5}\pi = \frac{35}{2}\pi(\text{cm}^2)$

5. (1) $S = \frac{1}{2}r^2\theta$ より $40\pi = \frac{1}{2} \times r^2 \times \frac{5}{4}\pi$. よって $r^2 = 64$. $r = 8(\text{cm})$

(2) $l = 8 \times \frac{5}{4}\pi = 10\pi(\text{cm})$