第5章 3.「弧度法」 第3回

解答

1. (1) $\frac{\pi}{2}$ (2) $\frac{\pi}{3}$ (3) $\frac{3}{5}\pi$ (4) $\frac{11}{6}\pi$ (5) $-\frac{5}{9}\pi$

2. (1) $30°$ (2) $135°$ (3) $80°$ (4) $270°$ (5) $-120°$

3. (1) $\frac{15}{2}\pi$ cm (2) $\frac{75}{2}\pi$ cm^2

4. (1) $\frac{2}{3}\pi$ (2) 27π cm^2

5. (1) 10 cm (2) 8π cm

解説

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

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

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

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

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

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

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) $l = 10 \times \frac{3}{4}\pi = \frac{15}{2}\pi(\text{cm})$ (2) $S = \frac{1}{2} \times 10^2 \times \frac{3}{4}\pi = \frac{75}{2}\pi(\text{cm}^2)$

4. (1) $l = r\theta$ より $6\pi = 9\theta$. よって $\theta = \frac{6\pi}{9} = \frac{2}{3}\pi$ (2) $S = \frac{1}{2} \times 9^2 \times \frac{2}{3}\pi = 27\pi(\text{cm}^2)$

5. (1) $S = \frac{1}{2}r^2\theta$ より $40\pi = \frac{1}{2} \times r^2 \times \frac{4}{5}\pi$. よって $r^2 = 100$. $r = 10(\text{cm})$

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