

## §6.1 ANGLE MEASURE

7/20/2016

# 1, 5-69 000

1. (a) ARC, 1

(b)  $\frac{\pi}{180}$

(c)  $\frac{180}{\pi}$

$$\underline{5.} \quad 15^\circ \cdot \frac{\pi \text{ RAD}}{180^\circ} = \frac{15\pi}{18 \cdot 12} = \boxed{\frac{\pi}{12} \text{ RAD}}$$

$$\underline{7.} \quad 54^\circ \cdot \frac{\pi \text{ RAD}}{180^\circ} = \frac{54\pi}{180} \text{ RAD} = \boxed{\frac{3\pi}{10} \text{ RAD}}$$

$$\underline{9.} \quad -45^\circ \cdot \frac{\pi \text{ RAD}}{180^\circ} = \boxed{-\frac{\pi}{4} \text{ RAD}}$$

$$\underline{11.} \quad 100^\circ \cdot \frac{\pi \text{ RAD}}{180^\circ} = \boxed{\frac{5\pi}{9} \text{ RAD}}$$

$$\underline{13.} \quad 1000^\circ \cdot \frac{\pi \text{ RAD}}{180^\circ} = \boxed{\frac{50\pi}{9} \text{ RAD}}$$

$$\underline{15.} \quad -70^\circ \cdot \frac{\pi \text{ RAD}}{180^\circ} = \boxed{-\frac{7\pi}{18} \text{ RAD}}$$

$$17. \quad \frac{5\pi}{3} \text{ RAD} \cdot \frac{180^\circ}{\pi \text{ RAD}} = \frac{5\pi \cdot 180}{3\pi}^\circ = \boxed{300^\circ}$$

$$19. \quad \frac{5\pi}{6} \text{ RAD} \cdot \frac{180^\circ}{\pi \text{ RAD}} = \boxed{150^\circ}$$

$$21. \quad 3 \text{ RAD} \cdot \frac{180^\circ}{\pi \text{ RAD}} = \boxed{\frac{540}{\pi}^\circ}$$

$$23. \quad -1.2 \text{ RAD} \cdot \frac{180^\circ}{\pi \text{ RAD}} = \boxed{-\frac{216}{\pi}^\circ}$$

$$25. \quad \frac{\pi}{10} \text{ RAD} \cdot \frac{180^\circ}{\pi \text{ RAD}} = \boxed{18^\circ}$$

$$27. \quad -\frac{2\pi}{15} \cdot \frac{180}{\pi} = \boxed{-24^\circ}$$

$$29. \quad \begin{array}{ccccccc} & \xleftarrow{-360^\circ} & & \xleftarrow{-360^\circ} & & \xrightarrow{+360^\circ} & & \xrightarrow{+360^\circ} \\ \underline{\underline{-670^\circ}} & & \underline{\underline{-310^\circ}} & & 50^\circ & & \underline{\underline{410^\circ}} & & \underline{\underline{770^\circ}} \\ \text{ETC.} & & & & & & & & \text{ETC.} \end{array}$$

$$31. \quad \begin{array}{ccccccc} & \xleftarrow{-2\pi} & & \xleftarrow{-2\pi} & & \xrightarrow{+2\pi} & & \xrightarrow{+2\pi} \\ \underline{\underline{\frac{-13\pi}{4}}} & & \underline{\underline{\frac{-5\pi}{4}}} & & \frac{3\pi}{4} & & \underline{\underline{\frac{11\pi}{4}}} & & \underline{\underline{\frac{19\pi}{4}}} \\ \text{ETC.} & & & & & & & & \text{ETC.} \end{array}$$

33.

ETC.

$$\begin{array}{ccccccc}
 & & \xrightarrow{-2\pi} & & \xrightarrow{-2\pi} & & \xrightarrow{+2\pi} & & \xrightarrow{+2\pi} & & \text{ETC.} \\
 & & & & & & & & & & \\
 & & -\frac{17\pi}{4} & & -\frac{9\pi}{4} & & -\frac{\pi}{4} & & \frac{7\pi}{4} & & \frac{15\pi}{4} \\
 & & \underline{\underline{\quad}} & & \underline{\underline{\quad}} & & & & \underline{\underline{\quad}} & & \underline{\underline{\quad}}
 \end{array}$$

35.

$$430^\circ - 70^\circ = 360^\circ \quad (\text{A MULTIPLE OF } 360^\circ)$$

$\therefore$  YES, COTERMINAL ✓

37.

$$\frac{17\pi}{6} - \frac{5\pi}{6} = \frac{12\pi}{6} = 2\pi \quad (\text{A MULTIPLE OF } 2\pi \text{ RAD})$$

$\therefore$  YES, COTERMINAL ✓

39.

$$875^\circ - 155^\circ = 720^\circ \quad (\text{A MULTIPLE OF } 360^\circ)$$

$\therefore$  YES, COTERMINAL ✓

41.

$$400^\circ - 360^\circ = \boxed{40^\circ}$$

JUST KEEP ADDING/SUBTRACTING

$360^\circ$  UNTIL YOU GET INTO  $[0, 360)$ .

43.

$$780^\circ - 2(360^\circ) = \boxed{60^\circ}$$

45.

$$-800^\circ + 3(360^\circ) = \boxed{280^\circ}$$

47.

$$\frac{19\pi}{6} - 2\pi = \boxed{\frac{7\pi}{6} \text{ RAD}}$$

JUST KEEP ADDING/SUBTRACTING

$2\pi$  RAD UNTIL YOU GET INTO  $[0, 2\pi)$ .

49.

$$25\pi - 12(2\pi) = \boxed{\pi \text{ RAD}}$$

$$\underline{51.} \quad \frac{17\pi}{4} - 2(2\pi) = \boxed{\frac{\pi}{4} \text{ RAD}}$$

$$\underline{53.} \quad s = r\theta = 9 \cdot \frac{5\pi}{6} = \boxed{\frac{15\pi}{2}}$$

$$\underline{55.} \quad s = r\theta$$

$$10 = 5\theta \rightarrow \theta = \boxed{2 \text{ RAD}}$$

$$\underline{57.} \quad s = r\theta = 5 \text{ cm} \cdot 3 \text{ RAD} = \boxed{15 \text{ cm}}$$

$$\underline{59.} \quad s = r\theta$$

$$14 \text{ m} = 9 \text{ m} \cdot \theta \rightarrow \theta = \boxed{\frac{14}{9} \text{ RAD}}$$

$$\frac{14}{9} \text{ RAD} \cdot \frac{180^\circ}{\pi \text{ RAD}} = \boxed{\frac{280}{\pi}^\circ}$$

$$\underline{61.} \quad s = r\theta$$

$$15 \text{ m} = r \cdot \frac{5\pi}{6} \rightarrow r = \frac{6 \cdot 15}{5\pi} = \boxed{\frac{18}{\pi} \text{ m}}$$

$$\underline{63.} \quad (a) \quad A = \frac{1}{2} r^2 \theta = \frac{1}{2} \cdot 8^2 \cdot \left( 80 \cdot \frac{\pi}{180} \right) = \frac{8^2 \cdot 80 \cdot \pi}{2 \cdot 180}$$

convert  $\theta$  to RAD

$$= \frac{32 \cdot 80 \pi}{180} = \frac{8 \cdot 80 \pi}{45} = \frac{8 \cdot 16 \pi}{9} = \boxed{\frac{128\pi}{9}}$$

$$(b) A = \frac{1}{2} r^2 \theta = \frac{1}{2} \cdot 10^2 \cdot \frac{1}{2} = \frac{100}{4} = \boxed{25}$$

$$\underline{65.} \quad A = \frac{1}{2} r^2 \theta = \frac{1}{2} \cdot 10^2 \cdot \frac{2\pi}{3} = \boxed{\frac{100\pi}{3}}$$

$$\underline{67.} \quad A = \frac{1}{2} r^2 \theta$$

$$70 = \frac{1}{2} r^2 \cdot \left( 140^\circ \cdot \frac{\pi \text{ RAD}}{180^\circ} \right) = \frac{1}{2} r^2 \cdot \frac{7\pi}{9}$$

CONVERT TO RAD.

$$70 = \frac{7\pi}{18} r^2 \rightarrow r^2 = 70 \cdot \frac{18}{7\pi} = \frac{180}{\pi}$$

$$r = \sqrt{\frac{180}{\pi}} = \boxed{\frac{6\sqrt{5}}{\sqrt{\pi}} \text{ or } \frac{6\sqrt{5\pi}}{\pi}}$$

$$\underline{69.} \quad A = \frac{1}{2} r^2 \theta$$

$$1600 = \frac{1}{2} \cdot 80^2 \theta \rightarrow \theta = \frac{2 \cdot 1600}{80^2} = \frac{3200}{6400} = \boxed{\frac{1}{2} \text{ RAD}}$$