

Angle equivalent

degree

radian

$$180^\circ = \pi$$

22) $r = 3 \text{ in}$, $\theta = 140^\circ \Rightarrow \theta = 140^\circ \left(\frac{\pi}{180^\circ} \right) = \frac{14\pi}{18} = \frac{7\pi}{9}$ radians

$A = r\theta = (3 \text{ in}) \left(\frac{7\pi}{9} \right) = \frac{7\pi}{3} \text{ in}$
 ↑
 angle must be in radians

for ex. 23, 25
 use area of a sector
 formula
 $A = \frac{1}{2} \theta r^2$

24) $r = 4.5 \text{ cm}$, $\theta = \frac{2\pi}{5} \text{ rad}$

$A = r\theta = (4.5 \text{ cm}) \left(\frac{2\pi}{5} \right) = \frac{9\pi}{5} \text{ cm}$

26) $\frac{3\pi}{4}$ radians: $\frac{3\pi}{4} \left(\frac{180^\circ}{\pi} \right) = \frac{3(180^\circ)}{4} = \frac{3(90^\circ)}{2} = 3(45^\circ) = \underline{\underline{135^\circ}}$

28) $-\frac{5\pi}{4}$ radians: $-\frac{5\pi}{4} \left(\frac{180^\circ}{\pi} \right) = \frac{-5(180^\circ)}{4} = -5(45^\circ) = \underline{\underline{-225^\circ}}$

30) $-\frac{7\pi}{3}$ radians: $-\frac{7\pi}{3} \left(\frac{180^\circ}{\pi} \right) = \frac{-7(180^\circ)}{3} = -7(60^\circ) = \underline{\underline{-420^\circ}}$

32) $\frac{11\pi}{6}$ radians: $\frac{11\pi}{6} \left(\frac{180^\circ}{\pi} \right) = \frac{11(180^\circ)}{6} = 11(30^\circ) = \underline{\underline{330^\circ}}$

$$34) 100^\circ : 100^\circ \left(\frac{\pi}{180^\circ} \right) = \frac{10\pi}{18} = \frac{5\pi}{9} \text{ radians}$$

$$36) -120^\circ : -120^\circ \left(\frac{\pi}{180^\circ} \right) = \frac{-12\pi}{18} = \frac{-6\pi}{9} = \frac{-2\pi}{3} \text{ radians}$$

$$38) -315^\circ : -315^\circ \left(\frac{\pi}{180^\circ} \right) = \frac{-315\pi}{180} = \frac{-63\pi}{36} = \frac{-21\pi}{12} = \frac{-7\pi}{4} \text{ radians}$$

for ex 40 - 49: exact values (no calculator)

$$40) r = 12 \text{ in}, \theta = \frac{\pi}{4} \text{ radians}$$

$$A = r\theta = (12 \text{ in}) \left(\frac{\pi}{4} \right) = \frac{12\pi}{4} = \underline{\underline{3\pi \text{ in}}}$$

$$42) r = 10 \text{ cm}, \theta = \frac{5\pi}{6} \text{ radians}$$

$$A = r\theta = (10 \text{ cm}) \left(\frac{5\pi}{6} \right) = \frac{(10)(5\pi)}{6} = \frac{5(5\pi)}{3} = \underline{\underline{\frac{25\pi}{3} \text{ cm}}}$$

$$44) r = 5 \text{ in}, \theta = 220^\circ = (220^\circ) \left(\frac{\pi}{180^\circ} \right) = \frac{22\pi}{18} = \frac{11\pi}{9} \text{ radians}$$

$$A = r\theta = (5 \text{ in}) \left(\frac{11\pi}{9} \right) = \underline{\underline{\frac{55\pi}{9} \text{ in}}}$$

$$46) r = 6 \text{ cm}, \theta = 45^\circ = (45^\circ) \left(\frac{\pi}{180^\circ} \right) = \frac{\pi}{4} \text{ radians}$$

$$A = \frac{1}{2} \theta r^2 = \frac{1}{2} \left(\frac{\pi}{4} \right) (6 \text{ cm})^2 = \frac{(6)(6)\pi}{2(4)} = \frac{(3)(3)\pi}{2} = \underline{\underline{\frac{9\pi}{2} \text{ cm}^2}}$$

48) diameter 10 ft $\rightarrow r = 5$ ft, $\theta = \frac{\pi}{2}$ radians

$$A = \frac{1}{2} \theta r^2 = \frac{1}{2} \left(\frac{\pi}{2} \right) (5 \text{ ft})^2 = \underline{\underline{\frac{25\pi}{4} \text{ ft}^2}}$$

50) -40° : $-40^\circ + 360^\circ = \underline{\underline{320^\circ}}$

52) 700° : $700^\circ - 360^\circ = \underline{\underline{340^\circ}}$

54) $-\frac{\pi}{9}$: $-\frac{\pi}{9} + 2\pi = \frac{-\pi}{9} + \frac{18\pi}{9} = \underline{\underline{\frac{17\pi}{9}}}$

56) $\frac{13\pi}{6}$: $\frac{13\pi}{6} - 2\pi = \frac{13\pi}{6} - \frac{12\pi}{6} = \underline{\underline{\frac{\pi}{6}}}$