4.2: # 1-9 odd, 10-25 all, 27-61 odd

1) $11.773^\circ \to$ DMS $\quad 11^\circ\ 46'\ 22.8''$

$.773 \times 60 = 46.38 \qquad .38 \times 60 = 22.8$

3) $141.549^\circ \to$ DMS $\quad 141^\circ\ 32'\ 56.4''$

$.549 \times 60 = 32.94 \qquad 0.94 \times 60 = 56.4$

5) $87^\circ\ 53'\ 10'' \to$ Decimal $\quad 87.886^\circ$

$53/60 = .88\overline{3} \qquad 10/3600 = 0.00\overline{308}$

7) $45^\circ\ 21'\ 25'' \to$ Decimal $\quad 45.357^\circ$

$21/60 = 35 \qquad 25/3600 = 0.0069$

9) $17^\circ\ 37'\ 50'' \to$ Decimal $\quad 17.631$

$37/60 = 0.61\overline{6} \qquad 50/60 = 0.01\overline{38}$

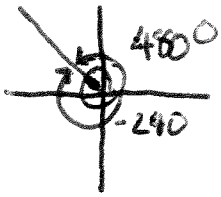
10) $\frac{\pi}{6} = 30^\circ$ $\qquad$ 11) $225^\circ = 5 \times 45^\circ = \frac{5\pi}{4}$

12) $-165^\circ = \frac{-165}{180}\pi = \frac{-11\pi}{12}$ $\qquad$ 13) $-45^\circ = -\frac{\pi}{4}$

14) $\frac{2\pi}{3} = 2(60^\circ) = 120^\circ$ $\qquad$ 15) $\frac{5\pi}{2} = 5(90^\circ) = 450^\circ$

16) $-\frac{\pi}{4} = -45^\circ$ $\qquad$ 17) $-\frac{7\pi}{6} = -7(30^\circ) = -210^\circ$

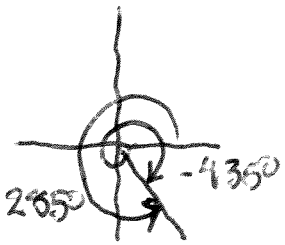
18) $120^\circ + n360^\circ$ $\quad 120^\circ + (1)(360^\circ) = 480^\circ$ $\quad 120^\circ + (-1)(360^\circ) = -240^\circ$



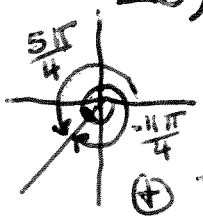
19) $-75^\circ + n360^\circ$

285°

-435°



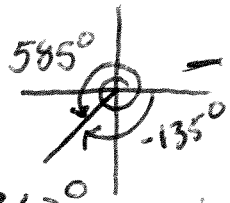
23) $-\frac{3\pi}{4} + 2n\pi = \frac{8n\pi}{4}$



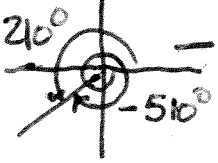
⊕ $-\frac{3\pi}{4} + \frac{8\pi}{4} = \frac{5\pi}{4}$

⊖ $-\frac{3\pi}{4} - \frac{8\pi}{4} = -\frac{11\pi}{4}$

20) $225^\circ + n360^\circ$ $\quad +585^\circ$ $\quad -135^\circ$

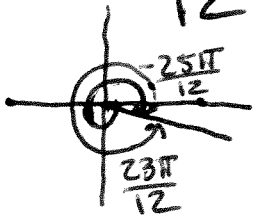


21) $-150^\circ + n360^\circ$ $\quad +210^\circ$ $\quad -510^\circ$



24) $-\frac{\pi}{12} + 2n\pi = \frac{24n\pi}{12}$

⊕ $\frac{23\pi}{12}$ ⊖ $-\frac{25\pi}{12}$



25) $\frac{3\pi}{2} + 2n\pi$

$\frac{4n\pi}{2}$ ⊕ $\frac{7\pi}{2}$ ⊖ $-\frac{\pi}{2}$

27) $s = r\theta = 2.5m \cdot \frac{\pi}{6} = \frac{2.5\pi}{6} m = \underline{1.31m}$

29) $4yd \cdot \frac{5\pi}{12} = \frac{20\pi}{12} yd = \frac{5\pi}{3} yd = \underline{5.24yd}$

31) $5mi \cdot 45^\circ = 5mi \cdot \frac{\pi}{4} = \frac{5\pi}{4} mi = \underline{3.93mi}$

33) a) $\frac{3024^\circ}{1} \cdot \frac{\pi}{180} = \frac{504\pi}{30} = \frac{168\pi}{10} = \frac{84\pi}{5} \times 13^{ft} = \frac{1092\pi}{5}$

a) $= \underline{686.1 ft}$

b) $\frac{84\pi}{5} \times 18ft = \frac{1512\pi}{5} = 950ft$

b) $\underline{-686}$

$\underline{264 ft}$

35) 135π rad/hour

$\div 2\pi = 67.5$ rev./hour

$\div 60 = 1.125$ rev./min.

37) $V = 82.3$ m/s, 131 rev/min

$V = \frac{s}{t} = \frac{r\theta}{t}$ $\quad 82.3 \text{ m/s} \times 60$

$\frac{4938 \text{ m/min}}{131 \text{ rev/min}} = \frac{37.7 \text{ m}}{\text{Rev}}$ $\quad 4938$ m/min

$\div 2\pi = 6$ m

39) $V = \frac{553 \text{ in}}{\text{hr}}$ $\quad \frac{0.09 \text{ rev}}{\text{min}}$

$\div 60$ $\frac{9.22 \text{ in}}{\text{min}} / \frac{0.09 \text{ rev}}{\text{min}} = \frac{102.4 \text{ in}}{\text{rev}} \div 2\pi = 16.3$ in

41) 646 - 840 rpm $\quad d = 26 \quad r = 13$

a) $2\pi \cdot 646 = 1292\pi$ rad/min $= 4058.9$ rad/min.

$2\pi \cdot 840 = 1680\pi$ rad/min $= 5277.9$ rad/min.

b) $13 \text{ in} \cdot 4058.9$ rad/min $= 52765.7$ in/min ~ 50 mph

$13 \text{ in} \cdot 5277.9$ rad/min $= 68612.4$ in/min ~ 65 mph

$\div 12 \div 5280 \quad \times 60$

43) $102^\circ/360^\circ \times \pi r^2 = 2 \text{ in}^2 = \frac{1}{2}(1.5)^2\left(\frac{51\pi}{90}\right)$

$102^\circ \cdot \frac{\pi}{180} = \frac{51\pi}{90}$

45) $12yd, \frac{2\pi}{5} \Rightarrow \frac{1}{2}(12)^2 \cdot \frac{2\pi}{5} = \frac{144\pi}{5} yd^2 = 90.5 yd^2$

47) $18ft, 177^\circ \Rightarrow \pi(18^2)\left(\frac{177}{360}\right) = 500.46 ft^2$

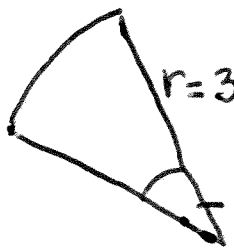
49) $360^\circ \div 20 = 18^\circ \quad \pi(9^2)\left(\frac{18}{360}\right) = 12.7 in^2$

51) $A = \frac{1}{2}r^2\theta \qquad 29 = \frac{1}{2}r^2\left(68^\circ \cdot \frac{\pi}{180^\circ}\right)$

$\frac{2A}{\theta} = r^2 \qquad 2(29) / \frac{34\pi}{90} = r^2 = 48.9 \quad r = 7ft$

53) $A = 377 in^2 \quad \theta = \frac{5\pi}{3} \qquad \frac{2(377)}{5\pi/3} = r^2 \quad r = \sqrt{144} = 12in$

55) a) $(0, \frac{\pi}{2})$ b) $(\frac{\pi}{2}, \pi)$ c) $(\pi, \frac{3\pi}{2})$ d) $(\frac{3\pi}{2}, 2\pi)$

57) 

$s = r\theta = 3963_{mi} \cdot 0.136_{rad} \approx 537.2 mi$

$41^\circ 12' - 33^\circ 26' = 7^\circ 46' = 7.77^\circ \cdot \frac{\pi}{180} = 0.136$

59) $s = r\theta \qquad \frac{15}{4.5} = \frac{4.5\theta}{4.5} \quad = 3.3 \text{ radians} \approx 191^\circ$

61) $3 = 2\theta \qquad \frac{3}{2} = \theta = 1.5 \text{ radians} \quad \approx 85.9^\circ$