HW Answers Unit 1 Lesson 2 p. 291 #43 - 93 odd

43. (a) $30^\circ = 30\left(\frac{\pi}{180}\right) = \frac{\pi}{6}$

(b) $150^\circ = 150\left(\frac{\pi}{180}\right) = \frac{5\pi}{6}$

45. (a) $-20^\circ = -20\left(\frac{\pi}{180}\right) = -\frac{\pi}{9}$

(b) $-240^\circ = -240\left(\frac{\pi}{180}\right) = -\frac{4\pi}{3}$

47. $115^\circ = 115\left(\frac{\pi}{180}\right) \approx 2.007$ radians

49. $-216.35^\circ = -216.35\left(\frac{\pi}{180}\right) \approx -3.776$ radians

51. $642^\circ = 642\left(\frac{\pi}{180}\right) \approx 11.205$ radians

53. $-0.78^\circ = -0.78\left(\frac{\pi}{180}\right) \approx -0.014$ radians

55. (a) $\frac{3\pi}{2} = \frac{3\pi}{2}\left(\frac{180}{\pi}\right)^\circ = 270^\circ$

(b) $-\frac{7\pi}{6} = -\frac{7\pi}{6}\left(\frac{180}{\pi}\right)^\circ = -210^\circ$

57. (a) $\frac{7\pi}{3} = \frac{7\pi}{3}\left(\frac{180^\circ}{\pi}\right) = 420^\circ$

(b) $-\frac{13\pi}{60} = -\frac{13\pi}{60}\left(\frac{180^\circ}{\pi}\right) = -39^\circ$

59. $\frac{\pi}{7} = \frac{\pi}{7}\left(\frac{180}{\pi}\right) \approx 25.714^\circ$

61. $\frac{25\pi}{8} = \frac{25\pi}{8}\left(\frac{180}{\pi}\right) = 562.5^\circ$

63. $-4.2\pi = -4.2\pi\left(\frac{180}{\pi}\right) = -756^\circ$

65. $-2 = -2\left(\frac{180}{\pi}\right) \approx -114.592^\circ$

67. (a) $64^\circ\,45' = 64^\circ + \left(\frac{45}{60}\right)^\circ = 64.75^\circ$

(b) $-124^\circ\,30' = -124^\circ - \left(\frac{30}{60}\right)^\circ = -124.5^\circ$

69. (a) $85^\circ\,18'\,30'' = 85^\circ + \left(\frac{18}{60}\right)^\circ + \left(\frac{30}{3600}\right)^\circ \approx 85.308^\circ$

(b) $-408^\circ\,16'\,25'' = -408^\circ - \left(\frac{16}{60}\right)^\circ - \left(\frac{25}{3600}\right)^\circ \approx -408.274^\circ$

71. (a) $280.6^\circ = 280^\circ + 0.6(60)' = 280^\circ\,36'$

(b) $-115.8^\circ = -115^\circ - 0.8(60)' = -115^\circ\,48'$

73. (a) $4.5 = 4.5\left(\frac{180}{\pi}\right)^\circ \approx 257^\circ\,49'\,51.628''$

(b) $-3.58 = -3.58\left(\frac{180}{\pi}\right)^\circ \approx -205^\circ\,7'\,8.006''$

75. $s = r\theta$

$6 = 5\theta$

$\theta = \frac{6}{5}$ radians

77. $s = r\theta$

$32 = 7\theta$

$\theta = \frac{32}{7} = 4\frac{4}{7}$ radians

79. $s = r\theta$

$8 = 15\theta$

$\theta = \frac{8}{15}$ radians

81. $s = r\theta$

$35 = 14.5\theta$

$\theta = \frac{70}{29} \approx 2.414$ radians

83. $s = r\theta$, θ in radians

$$s = 14(180)\left(\frac{\pi}{180}\right) = 14\pi \approx 43.982 \text{ inches}$$

85. $s = r\theta$

$$s = 6\left(\frac{2\pi}{3}\right) = 4\pi \approx 12.57 \text{ meters}$$

87. $\theta = 42^\circ\ 7'\ 15'' - 25^\circ\ 46'\ 37'' = 16^\circ\ 20'\ 38'' \approx 0.2853$ radian

$s = r\theta = 4000(0.2853) \approx 1141.02$ miles

89. $\theta = \dfrac{s}{r} = \dfrac{600}{6378} \approx 0.094$ radian $\approx 5.39^\circ$

91. $\theta = \dfrac{s}{r} = \dfrac{2.5}{6} = \dfrac{25}{60} = \dfrac{5}{12}$ radian $\approx 23.87^\circ$

93. (a) single axel: $1\frac{1}{2}$ revolutions $= 360^\circ + 180^\circ = 540^\circ$

$= 2\pi + \pi = 3\pi$ radians

(b) double axel: $2\frac{1}{2}$ revolutions $= 720^\circ + 180^\circ = 900^\circ$

$= 4\pi + \pi = 5\pi$ radians

(c) triple axel: $3\frac{1}{2}$ revolutions $= 1260^\circ$

$= 7\pi$ radians