4.2 HW Answers

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39. $\cos\frac{9\pi}{4} = \cos\left(\frac{\pi}{4} + 2\pi\right) = \cos\frac{\pi}{4} = \frac{\sqrt{2}}{2}$

40. $\csc\frac{9\pi}{4} = \csc\left(\frac{\pi}{4} + 2\pi\right) = \csc\frac{\pi}{4} = \sqrt{2}$

41. $\sin\left(-\frac{9\pi}{4}\right) = \sin\left(-\frac{9\pi}{4} + 4\pi\right) = \sin\frac{7\pi}{4} = -\frac{\sqrt{2}}{2}$

42. $\sec\left(-\frac{9\pi}{4}\right) = \sec\left(-\frac{9\pi}{4} + 4\pi\right) = \sec\frac{7\pi}{4} = \sqrt{2}$

43. $\tan\frac{5\pi}{4} = \tan\left(\frac{\pi}{4} + \pi\right) = \tan\frac{\pi}{4} = 1$

44. $\cot\frac{5\pi}{4} = \cot\left(\frac{\pi}{4} + \pi\right) = \cot\frac{\pi}{4} = 1$

45. $\cot\left(-\frac{5\pi}{4}\right) = \cot\left(\frac{3\pi}{4} - 2\pi\right) = \cot\frac{3\pi}{4} = -1$

46. $\tan\left(-\frac{9\pi}{4}\right) = \tan\left(-\frac{9\pi}{4} + 3\pi\right) = \tan\frac{3\pi}{4} = -1$

47. $-\tan\left(\frac{\pi}{4} + 15\pi\right) = -\tan\frac{\pi}{4} = -1$

48. $-\cot\left(\frac{\pi}{4} + 17\pi\right) = -\cot\frac{\pi}{4} = -1$

49. $\sin\left(-\frac{\pi}{4} - 1000\pi\right) = \sin\left(-\frac{\pi}{4} + 2\pi\right)$

$= \sin\frac{7\pi}{4}$

$= -\frac{\sqrt{2}}{2}$

50. $\sin\left(-\frac{\pi}{4} - 2000\pi\right) = \sin\left(-\frac{\pi}{4} + 2\pi\right)$

$= \sin\frac{7\pi}{4}$

$= -\frac{\sqrt{2}}{2}$

51. $\cos\left(-\frac{\pi}{4} - 1000\pi\right) = \cos\left(-\frac{\pi}{4} + 2\pi\right)$

$= \cos\frac{7\pi}{4}$

$= \frac{\sqrt{2}}{2}$

52. $\cos\left(-\frac{\pi}{4} - 2000\pi\right) = \cos\left(-\frac{\pi}{4} + 2\pi\right)$

$= \cos\frac{7\pi}{4}$

$= \frac{\sqrt{2}}{2}$

53. a. $\sin\frac{3\pi}{4} = \frac{\sqrt{2}}{2}$

b. $\sin\frac{11\pi}{4} = \sin\left(\frac{3\pi}{4} + 2\pi\right) = \sin\frac{3\pi}{4} = \frac{\sqrt{2}}{2}$

54. a. $\cos\frac{3\pi}{4} = -\frac{\sqrt{2}}{2}$

b. $\cos\frac{11\pi}{4} = \cos\left(\frac{3\pi}{4} + 2\pi\right) = \cos\frac{3\pi}{4} = -\frac{\sqrt{2}}{2}$

55. a. $\cos\frac{\pi}{2} = 0$

b. $\cos\frac{9\pi}{2} = \cos\left(\frac{\pi}{2} + 4\pi\right)$

$= \cos\left[\frac{\pi}{2} + 2(2\pi)\right]$

$= \cos\frac{\pi}{2}$

$= 0$

56. a. $\sin\frac{\pi}{2} = 1$

b. $\sin\frac{11\pi}{4} = \sin\left(\frac{3\pi}{4} + 2\pi\right) = \sin\frac{3\pi}{4} = \frac{\sqrt{2}}{2}$

56. a. $\sin\frac{\pi}{2} = 1$

b. $\sin\frac{9\pi}{2} = \sin\left(\frac{\pi}{2} + 4\pi\right) = \sin\frac{\pi}{2} = 1$

57. a. $\tan\pi = \frac{0}{-1} = 0$

b. $\begin{aligned}\tan 17\pi &= \tan(\pi + 16\pi)\\ &= \tan[\pi + 8(2\pi)]\\ &= \tan\pi\\ &= 0\end{aligned}$

58. a. $\cot\frac{\pi}{2} = \frac{0}{1} = 0$

b. $\cot\frac{15\pi}{2} = \cot\left(\frac{\pi}{2} + 7\pi\right) = \cot\frac{\pi}{2} = 0$

59. a. $\sin\frac{7\pi}{4} = -\frac{\sqrt{2}}{2}$

b. $\begin{aligned}\sin\frac{47\pi}{4} &= \sin\left(\frac{7\pi}{4} + 10\pi\right)\\ &= \sin\left[\frac{7\pi}{4} + 5(2\pi)\right]\\ &= \sin\frac{7\pi}{4}\\ &= -\frac{\sqrt{2}}{2}\end{aligned}$

$\frac{40\pi}{4}$

60. a. $\cos\frac{7\pi}{4} = \frac{\sqrt{2}}{2}$

b. $\cos\frac{47\pi}{4} = \cos\left(\frac{7\pi}{4} + 10\pi\right) = \cos\frac{7\pi}{4} = \frac{\sqrt{2}}{2}$