HW Answers Unit 6 Lesson 1 p. 320 Odds #13 – 17, 51 – 63, 97 - 101

13. $\sin\theta < 0 \implies \theta$ lies in Quadrant III or in Quadrant IV.
$\cos\theta < 0 \implies \theta$ lies in Quadrant II or in Quadrant III.
$\sin\theta < 0$ *and* $\cos\theta < 0 \implies \theta$ lies in Quadrant III.

15. $\sin\theta > 0 \implies \theta$ lies in Quadrant I or in Quadrant II.
$\tan\theta < 0 \implies \theta$ lies in Quadrant II or in Quadrant IV.
$\sin\theta > 0$ *and* $\tan\theta < 0 \implies \theta$ lies in Quadrant II.

17. $\cot\theta > 0 \implies \theta$ lies in Quadrant I or Quadrant III
$\cos\theta > 0 \implies \theta$ lies in Quadrant I or Quadrant IV
$\cot\theta > 0$ and $\cos\theta > 0 \implies \theta$ lies in Quadrant I

51. $\theta' = 45°$,
Quadrant III

$$\sin 225° = -\sin 45° = -\frac{\sqrt{2}}{2}$$

$$\cos 225° = -\cos 45° = -\frac{\sqrt{2}}{2}$$

$$\tan 225° = \tan 45° = 1$$

53. $\theta = -750°$ coterminal with 330°. Quadrant IV

$$\theta' = 360° - 330° = 30°$$

$$\sin(-750°) = -\sin 30° = -\frac{1}{2}$$

$$\cos(-750°) = \cos 30° = \frac{\sqrt{3}}{2}$$

$$\tan(-750°) = -\tan 30° = -\frac{\sqrt{3}}{3}$$

55. $\theta = -240°$ coterminal with 120°. Quadrant II

$$\theta' = 180° - 120° = 60°$$

$$\sin(-240°) = \sin 60° = \frac{\sqrt{3}}{2}$$

$$\cos(-240°) = -\cos 60° = -\frac{1}{2}$$

$$\tan(-240°) = -\tan 60° = -\sqrt{3}$$

57. $\theta = \frac{5\pi}{3}$. Quadrant IV

$$\theta' = 2\pi - \frac{5\pi}{3} = \frac{\pi}{3}$$

$$\sin\left(\frac{5\pi}{3}\right) = -\sin\left(\frac{\pi}{3}\right) = -\frac{\sqrt{3}}{2}$$

$$\cos\left(\frac{5\pi}{3}\right) = \cos\left(\frac{\pi}{3}\right) = \frac{1}{2}$$

$$\tan\left(\frac{5\pi}{3}\right) = -\tan\left(\frac{\pi}{3}\right) = -\sqrt{3}$$

59. $\theta' = \frac{\pi}{6}$, Quadrant IV

$$\sin\left(-\frac{\pi}{6}\right) = -\sin\frac{\pi}{6} = -\frac{1}{2}$$

$$\cos\left(-\frac{\pi}{6}\right) = \cos\frac{\pi}{6} = \frac{\sqrt{3}}{2}$$

$$\tan\left(-\frac{\pi}{6}\right) = -\tan\frac{\pi}{6} = -\frac{\sqrt{3}}{3}$$

63. $\theta = -\frac{7\pi}{6}$. Quadrant II

$$\theta' = \frac{\pi}{6}$$

$$\sin\left(-\frac{7\pi}{6}\right) = \sin\left(\frac{\pi}{6}\right) = \frac{1}{2}$$

$$\cos\left(-\frac{7\pi}{6}\right) = -\cos\left(\frac{\pi}{6}\right) = -\frac{\sqrt{3}}{2}$$

$$\tan\left(-\frac{7\pi}{6}\right) = -\tan\left(\frac{\pi}{6}\right) = -\frac{\sqrt{3}}{3}$$

97. $\sin\theta = -\frac{3}{5}$

$\sin^2\theta + \cos^2\theta = 1$

$\cos^2\theta = 1 - \sin^2\theta$

$\cos^2\theta = 1 - \left(-\frac{3}{5}\right)^2$

$\cos^2\theta = 1 - \frac{9}{25}$

$\cos^2\theta = \frac{16}{25}$

$\cos\theta > 0$ in Quadrant IV.

$\cos\theta = \frac{4}{5}$

99. $\tan\theta = \frac{3}{2}$

$\sec^2\theta = 1 + \tan^2\theta$

$\sec^2\theta = 1 + \left(\frac{3}{2}\right)^2$

$\sec^2\theta = 1 + \frac{9}{4}$

$\sec^2\theta = \frac{13}{4}$

$\sec\theta < 0$ in Quadrant III.

$\sec\theta = -\frac{\sqrt{13}}{2}$

101. $\cos\theta = \frac{5}{8}$

$\cos\theta = \frac{1}{\sec\theta} \Rightarrow \sec\theta = \frac{1}{\cos\theta}$

$\sec\theta = \frac{1}{5/8} = \frac{8}{5}$