

4.2B HW Answers

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$$\begin{aligned}
 25. \quad \sin t &= \frac{8}{17}, \cos t = \frac{15}{17} \\
 \tan t &= \frac{\frac{8}{17}}{\frac{15}{17}} = \frac{8}{15} \\
 \csc t &= \frac{17}{8} \\
 \sec t &= \frac{17}{15} \\
 \cot t &= \frac{15}{8}
 \end{aligned}$$

$$\begin{aligned}
 26. \quad \sin t &= \frac{3}{5}, \cos t = \frac{4}{5} \\
 \tan t &= \frac{\frac{3}{5}}{\frac{4}{5}} = \frac{3}{4} \\
 \csc t &= \frac{5}{3} \\
 \sec t &= \frac{5}{4} \\
 \cot t &= \frac{4}{3}
 \end{aligned}$$

$$29. \quad \sin t = \frac{6}{7}, 0 \leq t < \frac{\pi}{2}$$

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

$$\left(\frac{6}{7}\right)^2 + \cos^2 t = 1$$

$$\cos^2 t = 1 - \frac{36}{49}$$

$$\cos t = \sqrt{\frac{13}{49}} = \frac{\sqrt{13}}{7}$$

$$\begin{aligned}
 27. \quad \sin t &= \frac{1}{3}, \cos t = \frac{2\sqrt{2}}{3} \\
 \tan t &= \frac{\frac{1}{3}}{\frac{2\sqrt{2}}{3}} = \frac{\sqrt{2}}{4} \\
 \csc t &= 3 \\
 \sec t &= \frac{3\sqrt{2}}{4} \\
 \cot t &= 2\sqrt{2}
 \end{aligned}$$

$$\begin{aligned}
 28. \quad \sin t &= \frac{2}{3}, \cos t = \frac{\sqrt{5}}{3} \\
 \tan t &= \frac{\frac{2}{3}}{\frac{\sqrt{5}}{3}} = \frac{2\sqrt{5}}{5} \\
 \csc t &= \frac{3}{2} \\
 \sec t &= \frac{3\sqrt{5}}{5} \\
 \cot t &= \frac{\sqrt{5}}{2}
 \end{aligned}$$

$$31. \quad \sin t = \frac{\sqrt{39}}{8}, 0 \leq t < \frac{\pi}{2}$$

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

$$\left(\frac{\sqrt{39}}{8}\right)^2 + \cos^2 t = 1$$

$$\cos^2 t = 1 - \frac{39}{64}$$

$$\cos t = \sqrt{\frac{25}{64}} = \frac{5}{8}$$

$$\cos t = \sqrt{\frac{15}{49}} = \frac{\sqrt{15}}{7}$$

Because $0 \leq t < \frac{\pi}{2}$, $\cos t$ is positive.

$$30. \quad \sin t = \frac{7}{8}, 0 \leq t < \frac{\pi}{2}$$

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

$$\left(\frac{7}{8}\right)^2 + \cos^2 t = 1$$

$$\cos^2 t = 1 - \frac{49}{64}$$

$$\cos t = \sqrt{\frac{15}{64}} = \frac{\sqrt{15}}{8}$$

Because $0 \leq t < \frac{\pi}{2}$, $\cos t$ is positive.

$$\cos t = \sqrt{\frac{25}{64}} = \frac{5}{8}$$

Because $0 \leq t < \frac{\pi}{2}$, $\cos t$ is positive.

$$32. \quad \sin t = \frac{\sqrt{21}}{5}, 0 \leq t < \frac{\pi}{2}$$

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

$$\left(\frac{\sqrt{21}}{5}\right)^2 + \cos^2 t = 1$$

$$\cos^2 t = 1 - \frac{21}{25}$$

$$\cos t = \sqrt{\frac{4}{25}} = \frac{2}{5}$$

Because $0 \leq t < \frac{\pi}{2}$, $\cos t$ is positive.

$$33. \quad \sin 1.7 \csc 1.7 = \sin 1.7 \left(\frac{1}{\sin 1.7} \right) = 1$$

$$34. \quad \cos 2.3 \sec 2.3 = \cos 2.3 \left(\frac{1}{\cos 2.3} \right) = 1$$

$$35. \quad \sin^2 \frac{\pi}{6} + \cos^2 \frac{\pi}{6} = 1 \text{ by the Pythagorean identity.}$$

$$36. \quad \sin^2 \frac{\pi}{3} + \cos^2 \frac{\pi}{3} = 1 \text{ because}$$

$$\sin^2 t + \cos^2 t = 1.$$

$$37. \quad \sec^2 \frac{\pi}{3} - \tan^2 \frac{\pi}{3} = 1 \text{ because } 1 + \tan^2 t = \sec^2 t.$$

$$38. \quad \csc^2 \frac{\pi}{6} - \cot^2 \frac{\pi}{6} = 1 \text{ because}$$

$$1 + \cot^2 t = \csc^2 t.$$

$$61. \quad \sin 0.8 \approx 0.7174$$

$$62. \quad \cos 0.6 \approx 0.8253$$

$$63. \quad \tan 3.4 \approx 0.2643$$

$$64. \quad \tan 3.7 \approx 0.6247$$

$$65. \quad \csc 1 \approx 1.1884$$

$$66. \quad \sec 1 \approx 1.8508$$

$$67. \quad \cos \frac{\pi}{10} \approx 0.9511$$

$$68. \quad \sin \frac{3\pi}{10} \approx 0.8090$$

$$69. \quad \cot \frac{\pi}{12} \approx 3.7321$$

$$70. \quad \cot \frac{\pi}{5} \approx 5.6713$$

70. $\cot \frac{\pi}{18} \approx 5.6713$