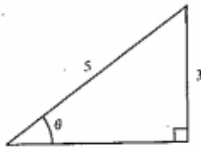


HW Answers Unit 5 Lesson 4 p. 310 Odds #1 – 5, 11 – 23, 33 – 37

1.



$$\text{adj} = \sqrt{5^2 - 3^2} = \sqrt{16} = 4$$

$$\sin \theta = \frac{\text{opp}}{\text{hyp}} = \frac{3}{5}$$

$$\csc \theta = \frac{\text{hyp}}{\text{opp}} = \frac{5}{3}$$

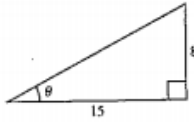
$$\cos \theta = \frac{\text{adj}}{\text{hyp}} = \frac{4}{5}$$

$$\sec \theta = \frac{\text{hyp}}{\text{adj}} = \frac{5}{4}$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{3}{4}$$

$$\cot \theta = \frac{\text{adj}}{\text{opp}} = \frac{4}{3}$$

3.



$$\text{hyp} = \sqrt{8^2 + 15^2} = 17$$

$$\sin \theta = \frac{\text{opp}}{\text{hyp}} = \frac{8}{17}$$

$$\csc \theta = \frac{\text{hyp}}{\text{opp}} = \frac{17}{8}$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}} = \frac{15}{17}$$

$$\sec \theta = \frac{\text{hyp}}{\text{adj}} = \frac{17}{15}$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{8}{15}$$

$$\cot \theta = \frac{\text{adj}}{\text{opp}} = \frac{15}{8}$$

5.



$$\text{hyp} = \sqrt{18^2 + 12^2} = \sqrt{468} = 6\sqrt{13}$$

$$\sin \theta = \frac{\text{opp}}{\text{hyp}} = \frac{18}{6\sqrt{13}} = \frac{3}{\sqrt{13}} = \frac{3\sqrt{13}}{13}$$

$$\csc \theta = \frac{\text{hyp}}{\text{opp}} = \frac{\sqrt{13}}{3}$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}} = \frac{12}{6\sqrt{13}} = \frac{2}{\sqrt{13}} = \frac{2\sqrt{13}}{13}$$

$$\sec \theta = \frac{\text{hyp}}{\text{adj}} = \frac{\sqrt{13}}{2}$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{18}{12} = \frac{3}{2}$$

$$\cot \theta = \frac{\text{adj}}{\text{opp}} = \frac{2}{3}$$

11. Given: $\sin \theta = \frac{5}{6} = \frac{\text{opp}}{\text{hyp}}$

$$5^2 + (\text{adj})^2 = 6^2$$

$$\text{adj} = \sqrt{11}$$

$$\cos \theta = \frac{\sqrt{11}}{6}$$

$$\tan \theta = \frac{5}{\sqrt{11}} = \frac{5\sqrt{11}}{11}$$

$$\cot \theta = \frac{\sqrt{11}}{5}$$

$$\sec \theta = \frac{6}{\sqrt{11}} = \frac{6\sqrt{11}}{11}$$

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



13. Given: $\sec \theta = 4 = \frac{4}{1} = \frac{\text{hyp}}{\text{adj}}$

$$(\text{opp})^2 + 1^2 = 4^2$$

$$\text{opp} = \sqrt{15}$$

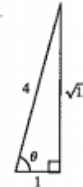
$$\sin \theta = \frac{\sqrt{15}}{4}$$

$$\cos \theta = \frac{1}{4}$$

$$\tan \theta = \sqrt{15}$$

$$\cot \theta = \frac{1}{\sqrt{15}} = \frac{\sqrt{15}}{15}$$

$$\csc \theta = \frac{4}{\sqrt{15}} = \frac{4\sqrt{15}}{15}$$



15. Given: $\tan \theta = 3 = \frac{3}{1} = \frac{\text{opp}}{\text{adj}}$

$$3^2 + 1^2 = (\text{hyp})^2$$

$$\text{hyp} = \sqrt{10}$$

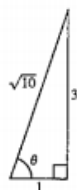
$$\sin \theta = \frac{3\sqrt{10}}{10}$$

$$\cos \theta = \frac{\sqrt{10}}{10}$$

$$\cot \theta = \frac{1}{3}$$

$$\sec \theta = \sqrt{10}$$

$$\csc \theta = \frac{\sqrt{10}}{3}$$



17. Given: $\cot \theta = \frac{9}{4} = \frac{\text{adj}}{\text{hyp}}$

$$4^2 + 9^2 = (\text{hyp})^2$$

$$\text{hyp} = \sqrt{97}$$

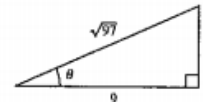
$$\sin \theta = \frac{4}{\sqrt{97}} = \frac{4\sqrt{97}}{97}$$

$$\cos \theta = \frac{9}{\sqrt{97}} = \frac{9\sqrt{97}}{97}$$

$$\tan \theta = \frac{4}{9}$$

$$\sec \theta = \frac{\sqrt{97}}{9}$$

$$\csc \theta = \frac{\sqrt{97}}{4}$$



$$19. \sin 60^\circ = \frac{\sqrt{3}}{2}, \cos 60^\circ = \frac{1}{2}$$

$$(a) \tan 60^\circ = \frac{\sin 60^\circ}{\cos 60^\circ} = \sqrt{3}$$

$$(b) \sin 30^\circ = \cos 60^\circ = \frac{1}{2}$$

$$(c) \cos 30^\circ = \sin 60^\circ = \frac{\sqrt{3}}{2}$$

$$(d) \cot 60^\circ = \frac{\cos 60^\circ}{\sin 60^\circ} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

$$21. \csc \theta = 3, \sec \theta = \frac{3\sqrt{2}}{4}$$

$$(a) \sin \theta = \frac{1}{\csc \theta} = \frac{1}{3}$$

$$(b) \cos \theta = \frac{1}{\sec \theta} = \frac{2\sqrt{2}}{3}$$

$$(c) \tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{1/3}{(2\sqrt{2})/3} = \frac{\sqrt{2}}{4}$$

$$(d) \sec(90^\circ - \theta) = \csc \theta = 3$$

$$23. \cos \alpha = \frac{1}{4}$$

$$(a) \sec \alpha = \frac{1}{\cos \alpha} = 4$$

$$(b) \sin^2 \alpha + \cos^2 \alpha = 1$$

$$\sin^2 \alpha + \left(\frac{1}{4}\right)^2 = 1$$

$$\sin^2 \alpha = \frac{15}{16}$$

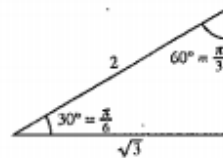
$$\sin \alpha = \pm \frac{\sqrt{15}}{4}$$

$$(c) \cot \alpha = \frac{\cos \alpha}{\sin \alpha} = \pm \frac{1/4}{\sqrt{15}/4} = \pm \frac{1}{\sqrt{15}} = \pm \frac{\sqrt{15}}{15}$$

$$(d) \sin(90^\circ - \alpha) = \cos \alpha = \frac{1}{4}$$

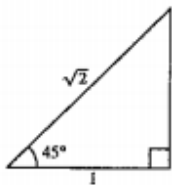
$$33. (a) \cos 60^\circ = \frac{1}{2}$$

$$(b) \tan \frac{\pi}{6} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$



$$35. (a) \cot \frac{\pi}{4} = \cot 45^\circ = 1$$

$$(b) \cos 45^\circ = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$



$$37. (a) \cos \frac{\pi}{6} = \cos 30^\circ = \frac{\sqrt{3}}{2}$$

$$(b) \sec 60^\circ = \frac{1}{\cos 60^\circ} = 2$$