4.3 HW Answers

Monday, October 16, 2017 12:07 PM

4. $a^2 + 15^2 = 17^2$

$a^2 = 289 - 225 = 64$

$a = \sqrt{64} = 8$

$\sin\theta = \dfrac{\text{opposite}}{\text{hypotenuse}} = \dfrac{8}{17}$

$\cos\theta = \dfrac{\text{adjacent}}{\text{hypotenuse}} = \dfrac{15}{17}$

$\tan\theta = \dfrac{\text{opposite}}{\text{adjacent}} = \dfrac{8}{15}$

$\csc\theta = \dfrac{\text{hypotenuse}}{\text{opposite}} = \dfrac{17}{8}$

$\sec\theta = \dfrac{\text{hypotenuse}}{\text{adjacent}} = \dfrac{17}{15}$

$\cot\theta = \dfrac{\text{adjacent}}{\text{opposite}} = \dfrac{15}{8}$

9.) $\frac{1}{2}$ 11) $\sqrt{2}$ 13) $\sqrt{3}$

15.) 0 17.) $\frac{\sqrt{6}-4}{4}$ 19) $\frac{12\sqrt{3}+\sqrt{6}}{6}$

21. $\sin 7^\circ = \cos(90^\circ - 7^\circ) = \cos 83^\circ$

22. $\sin 19^\circ = \cos(90^\circ - 19^\circ) = \cos 71^\circ$

23. $\csc 25^\circ = \sec(90^\circ - 25^\circ) = \sec 65^\circ$

24. $\csc 35^\circ = \sec(90^\circ - 35^\circ) = \sec 55^\circ$

25. $\tan\dfrac{\pi}{9} = \cot\left(\dfrac{\pi}{2} - \dfrac{\pi}{9}\right)$

$= \cot\left(\dfrac{9\pi}{18} - \dfrac{2\pi}{18}\right)$

$= \cot\dfrac{7\pi}{18}$

26. $\tan\dfrac{\pi}{7} = \cot\left(\dfrac{\pi}{2} - \dfrac{\pi}{7}\right) = \cot\left(\dfrac{7\pi}{14} - \dfrac{2\pi}{14}\right) = \cot\dfrac{5\pi}{14}$

27. $\cos\dfrac{2\pi}{5} = \sin\left(\dfrac{\pi}{2} - \dfrac{2\pi}{5}\right)$

$= \sin\left(\dfrac{5\pi}{10} - \dfrac{4\pi}{10}\right)$

$= \sin\dfrac{\pi}{10}$

28. $\cos\dfrac{3\pi}{8} = \sin\left(\dfrac{\pi}{2} - \dfrac{3\pi}{8}\right) = \sin\left(\dfrac{4\pi}{8} - \dfrac{3\pi}{8}\right) = \sin\dfrac{\pi}{8}$

31. $\cos 34^\circ = \dfrac{b}{220}$

$b = 220\cos 34^\circ$

$b \approx 220(0.8290) \approx 182$ in.

33. $\sin 23^\circ = \dfrac{16}{c}$

$c = \dfrac{16}{\sin 23^\circ} \approx \dfrac{16}{0.3907} \approx 41$ m

37) 78°

38) 88°

39) 1.147 radians

40) 1.253 radians

41) .395 radians

$\sin 23°$ 0.3907

35) 17°

36) 29°

41) .313 radians

42) .473 radians

54. $\tan 40° = \dfrac{h}{35}$

$h = 35 \tan 40°$

$h \approx 35(0.8391) \approx 29$

The tree's height is approximately 29 feet.

55. $\tan \theta = \dfrac{125}{172}$

Use a calculator in degree mode to find θ.

Many Scientific Calculators	Many Graphing Calculators
125 ÷ 172 = TAN^{-1}	TAN^{-1} (125 ÷ 172) ENTER

The display should show approximately 36. Thus, the angle of elevation of the sun is approximately 36°.

57. $\sin 10° = \dfrac{500}{c}$

$c = \dfrac{500}{\sin 10°} \approx \dfrac{500}{0.1736} \approx 2880$

The plane has flown approximately 2880 feet.

58. $\sin 5° = \dfrac{a}{5000}$

$a = 5000 \sin 5° \approx 5000(0.0872) = 436$

The driver's increase in altitude was approximately 436 feet.

59. $\cos \theta = \dfrac{60}{75}$

Use a calculator in degree mode to find θ.

Many Scientific Calculators	Many Graphing Calculators
60 ÷ 75 = COS^{-1}	COS^{-1} (60 ÷ 75) ENTER

The display should show approximately 37. Thus, the angle between the wire and the pole is approximately 37°.