Math 121 – Section 6.2 Solutions

11. $\cos\theta = \dfrac{\sqrt{3}}{2},\ \sin\theta = \dfrac{1}{2},\ \tan\theta = \dfrac{1}{\sqrt{3}},\ \sec\theta = \dfrac{2}{\sqrt{3}},\ \csc\theta = 2,\ \cot\theta = \sqrt{3}$

13. $\cos\theta = -\dfrac{2}{5},\ \sin\theta = \dfrac{\sqrt{21}}{5},\ \tan\theta = -\dfrac{\sqrt{21}}{2},\ \sec\theta = -\dfrac{5}{2},\ \csc\theta = \dfrac{5}{\sqrt{21}},\ \cot\theta = -\dfrac{2}{\sqrt{21}}$

15. $\cos\theta = -\dfrac{\sqrt{2}}{2},\ \sin\theta = \dfrac{\sqrt{2}}{2},\ \tan\theta = -1,\ \sec\theta = -\sqrt{2},\ \csc\theta = \sqrt{2},\ \cot\theta = -1$

17. $\cos\theta = \dfrac{2\sqrt{2}}{3},\ \sin\theta = -\dfrac{1}{3},\ \tan\theta = -\dfrac{1}{2\sqrt{2}},\ \sec\theta = \dfrac{3}{2\sqrt{2}},\ \csc\theta = -3,\ \cot\theta = -2\sqrt{2}$

19. $\sin\dfrac{11\pi}{2} = -1$

21. $\tan 6\pi = 0$

23. $\csc\dfrac{11\pi}{2} = -1$

25. $\cos\left(-\dfrac{3\pi}{2}\right) = 0$

27. $\sec -\pi = -1$

29. $\sin 45^\circ + \cos 60^\circ = \dfrac{\sqrt{2}}{2} + \dfrac{1}{2}$

31. $\sin 90^\circ + \tan 45^\circ = 1 + 1 = 2$

33. $\sin 45^\circ \cos 45^\circ = \left(\dfrac{\sqrt{2}}{2}\right)\left(\dfrac{\sqrt{2}}{2}\right) = \dfrac{1}{2}$

35. $\csc 45^\circ \tan 60^\circ = (\sqrt{2})(\sqrt{3}) = \sqrt{6}$

37. $4\sin 90^\circ - 3\tan 180^\circ = 4(1) - 3(0) = 4$

39. $2\sin\dfrac{\pi}{3} - 3\tan\dfrac{\pi}{6} = 2\left(\dfrac{\sqrt{3}}{2}\right) - 3\left(\dfrac{\sqrt{3}}{3}\right) = 0$

41. $\sin\dfrac{\pi}{4} - \cos\dfrac{\pi}{4} = 0$

43. $2\sec\dfrac{\pi}{4} + 4\cot\dfrac{\pi}{3} = 2(\sqrt{2}) + 4\left(\dfrac{\sqrt{3}}{3}\right) = 2\sqrt{2} + \dfrac{4\sqrt{3}}{3}$

45. $\tan\pi - \cos 0 = 0 - 1 = -1$

47. $\csc\dfrac{\pi}{2} + \cot\dfrac{\pi}{2} = 1 + 0 = 1$

83. If $(-3, 4)$ lies on the terminal side of θ then:

$$r = \sqrt{x^2 + y^2} = \sqrt{(-3)^2 + 4^2} = 5$$

and the six trig functions of θ are:

$$\sin\theta = \frac{4}{5},\ \cos\theta = -\frac{3}{5},\ \tan\theta = -\frac{4}{3},\ \sec\theta = -\frac{5}{3},\ \csc\theta = \frac{5}{4},\ \cot\theta = -\frac{3}{4}$$

85. If $(2, -3)$ lies on the terminal side of θ then:

$$r = \sqrt{x^2 + y^2} = \sqrt{2^2 + (-3)^2} = \sqrt{13}$$

and the six trig functions of θ are:

$$\sin\theta = -\frac{3}{\sqrt{13}},\ \cos\theta = \frac{2}{\sqrt{13}},\ \tan\theta = -\frac{3}{2},\ \sec\theta = \frac{\sqrt{13}}{2},\ \csc\theta = -\frac{\sqrt{13}}{3},\ \cot\theta = -\frac{2}{3}$$

87. If $(-2, 2)$ lies on the terminal side of θ then:

$$r = \sqrt{x^2 + y^2} = \sqrt{(-2)^2 + (-2)^2} = 2\sqrt{2}$$

and the six trig functions of θ are:

$$\sin\theta = -\frac{\sqrt{2}}{2},\ \cos\theta = -\frac{\sqrt{2}}{2},\ \tan\theta = 1,\ \sec\theta = -\sqrt{2},\ \csc\theta = -\sqrt{2},\ \cot\theta = -1$$