

Worked Out 14.3 AA2

③ $\sin \theta = \frac{1}{3}$ $\frac{\text{opp}}{\text{hyp}}$

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

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

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

opp = 1

hyp = 3

adj = $2\sqrt{2}$

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

$$\sqrt{\cos^2 \theta} = \frac{\sqrt{8}}{3}$$

$$\cos \theta = \frac{\sqrt{8}}{3} = \frac{2\sqrt{2}}{3}$$

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

$$\csc \theta = 3$$

$$\cos \theta = \frac{2\sqrt{2}}{3}$$

$$\sec \theta =$$

$$\tan \theta = \frac{\sqrt{2}}{4}$$

⑤ $\cos \theta = \frac{5}{6}$

$$\sin^2 \theta + \left(\frac{5}{6}\right)^2 = 1$$

$$\sin^2 \theta + \frac{25}{36} = \frac{36}{36}$$

$$\sin^2 \theta = \frac{11}{36}$$

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

adj = 5

hyp = 6

opp = $\sqrt{11}$

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

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

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

⑪ $\frac{\sin(-\theta)}{\cos(-\theta)}$

$$\frac{-\sin \theta}{\cos \theta}$$

$$-\tan \theta$$

⑬ $\cos \theta (1 + \tan^2 \theta)$

$$\cos \theta \cdot \sec^2 \theta$$

$$\frac{1}{\sec \theta} \cdot \frac{\sec^2 \theta}{1}$$

$$\sec \theta$$

$$(15) \quad \frac{\cos\left(\frac{\pi}{2} - x\right)}{\csc x} = \frac{\sin x}{\csc x} = \frac{\sin x}{\frac{1}{\sin x}} = \sin^2 x$$

$$(17) \quad \sin\left(\frac{\pi}{2} - \theta\right) \sec \theta$$

$$\cos \theta \cdot \sec \theta$$

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

$$(25) \quad \sin x \csc x = 1$$

$$\frac{\sin x}{\sin x} \cdot \frac{1}{\sin x} = 1$$

$$1 = 1 \checkmark$$

$$(27) \quad \frac{\cos\left(\frac{\pi}{2} - \theta\right) + 1}{1 - \sin(-\theta)} = 1$$

$$\frac{\sin \theta + 1}{1 + \sin \theta} = 1$$

$$1 = 1 \checkmark$$

$$(29) \quad \frac{\csc^2 \theta - \cot^2 \theta}{1 - \sin^2 \theta} = \sec^2 \theta$$

$$\frac{1}{\cos^2 \theta} = \sec^2 \theta$$

$$\sec^2 \theta = \sec^2 \theta$$

$$(31) \quad \sin x + \cos x \cot x = \csc x$$

$$\left(\frac{\sin x}{\sin x}\right) \sin x + \frac{\cos x \cdot \cos x}{\sin x} = \csc x$$

$$\frac{\sin^2 x}{\sin x} + \frac{\cos^2 x}{\sin x} = \csc x$$

$$\frac{\sin^2 x + \cos^2 x}{\sin x} = \csc x$$

$$\frac{1}{\sin x} = \csc x$$