

Use the Fundamental Trig. Identities to evaluate all 6 trig functions:

$$1. \tan\theta = \frac{1}{3}$$

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

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

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

$$\cos\theta \left(\tan\theta = \frac{\sin\theta}{\cos\theta} \cdot \cos\theta \right)$$

$$\cos\theta \cdot \tan\theta = \sin\theta$$

$$\left(\frac{3\sqrt{10}}{10} \right) \left(\frac{1}{3} \right) = \frac{\sqrt{10}}{10}$$

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

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

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

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

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

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

$$2. \csc\left(\frac{\pi}{2} - \theta\right) = 3$$

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

$$\downarrow$$

$$\sec\theta = 3$$

$$\downarrow$$

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

$$\csc\theta = \frac{3}{2\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{3\sqrt{2}}{4}$$

$$\tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{\frac{2\sqrt{2}}{3}}{\frac{1}{3}}$$

$$\bullet \sin\theta = \frac{2\sqrt{2}}{3}$$

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

$$\tan\theta = \frac{2\sqrt{2}}{1}$$

$$\csc\theta = \frac{3\sqrt{2}}{4}$$

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

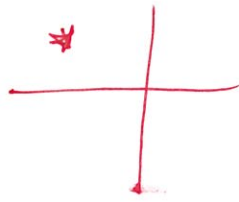
$$\cot\theta = \frac{\sqrt{2}}{4}$$

$$\tan\theta = \frac{2\sqrt{2}}{3} \cdot \frac{3}{1} = 2\sqrt{2}$$

$$\cot\theta = \frac{1}{2\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{4}$$

3. $\sec\theta = -5$

$\tan(-)$
 $\tan < 0$



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$$1 + \tan^2\theta = \sec^2\theta$$

$$1 + \tan^2\theta = 25$$

$$\tan^2\theta = 24$$

$$\tan\theta = \pm\sqrt{24}$$

$$\tan\theta = -\sqrt{24}$$

↓

$$\cot\theta = \frac{1}{-\sqrt{24}} = -\frac{\sqrt{24}}{24}$$

Rationalize

$$\frac{\sin\theta}{\cos\theta} = \tan\theta$$

$$\sin\theta = \tan\theta \cdot \cos\theta$$

$$\sin\theta = -\sqrt{24} \cdot -\frac{1}{5} = \frac{\sqrt{24}}{5} =$$

↓

$$\csc\theta = \frac{5}{\sqrt{24}} = \frac{5\sqrt{24}}{24} = \frac{10\sqrt{6}}{24} = \frac{5\sqrt{6}}{12}$$

$$\sin\theta = \frac{\sqrt{24}/5} = \frac{2\sqrt{6}}{5}$$

$$\cos\theta = -\frac{1}{5}$$

$$\tan\theta = \frac{-\sqrt{24}}{1} = -2\sqrt{6}$$

$$\csc\theta = \frac{5\sqrt{24}}{24} = \frac{5\sqrt{6}}{12}$$

$$\sec\theta = -5$$

$$\cot\theta = \frac{-\sqrt{24}}{24}$$

$$= \frac{-2\sqrt{6}}{24}$$

$$= -\frac{\sqrt{6}}{12}$$