Basic Trigonometric Identities and Equations

Trigonometric Identities

Quotient Identities

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

Reciprocal Identities

$$\sin\theta = \frac{1}{\csc\theta} \qquad \cos\theta = \frac{1}{\sec\theta} \qquad \tan\theta = \frac{1}{\cot\theta}$$

Pythagorean Identities

$$\sin\theta^2 + \cos\theta^2 = 1 \qquad \tan\theta^2 + 1 = \sec\theta^2 \qquad \cot\theta^2 + 1 = \csc\theta^2$$

$$\sin\theta^2 = 1 - \cos\theta^2 \qquad \tan\theta^2 = \sec\theta^2 - 1 \qquad \cot\theta^2 = \csc\theta^2 - 1$$

Using the identities you now know, find the trig value.

1.) If $\cos\theta = 3/4$, find $\sec\theta$

$$\sec\theta = \frac{1}{\cos\theta} = \frac{1}{\frac{3}{4}} = \frac{4}{3}$$

2.) If $\cos\theta = 3/5$, find $\csc\theta$

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

$$\sin\theta^2 + (\frac{3}{5})^2 = 1$$

Simplify each expression

1.) If $\cos\theta = 3/4$, find $\sec\theta$

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

2.) If $\cos\theta = 3/5$, find $\csc\theta$

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

$$\sin\theta^2 + (\frac{3}{5})^2 = 1$$

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

$$\sin\theta^2 + (\frac{3}{5})^2 = 1$$

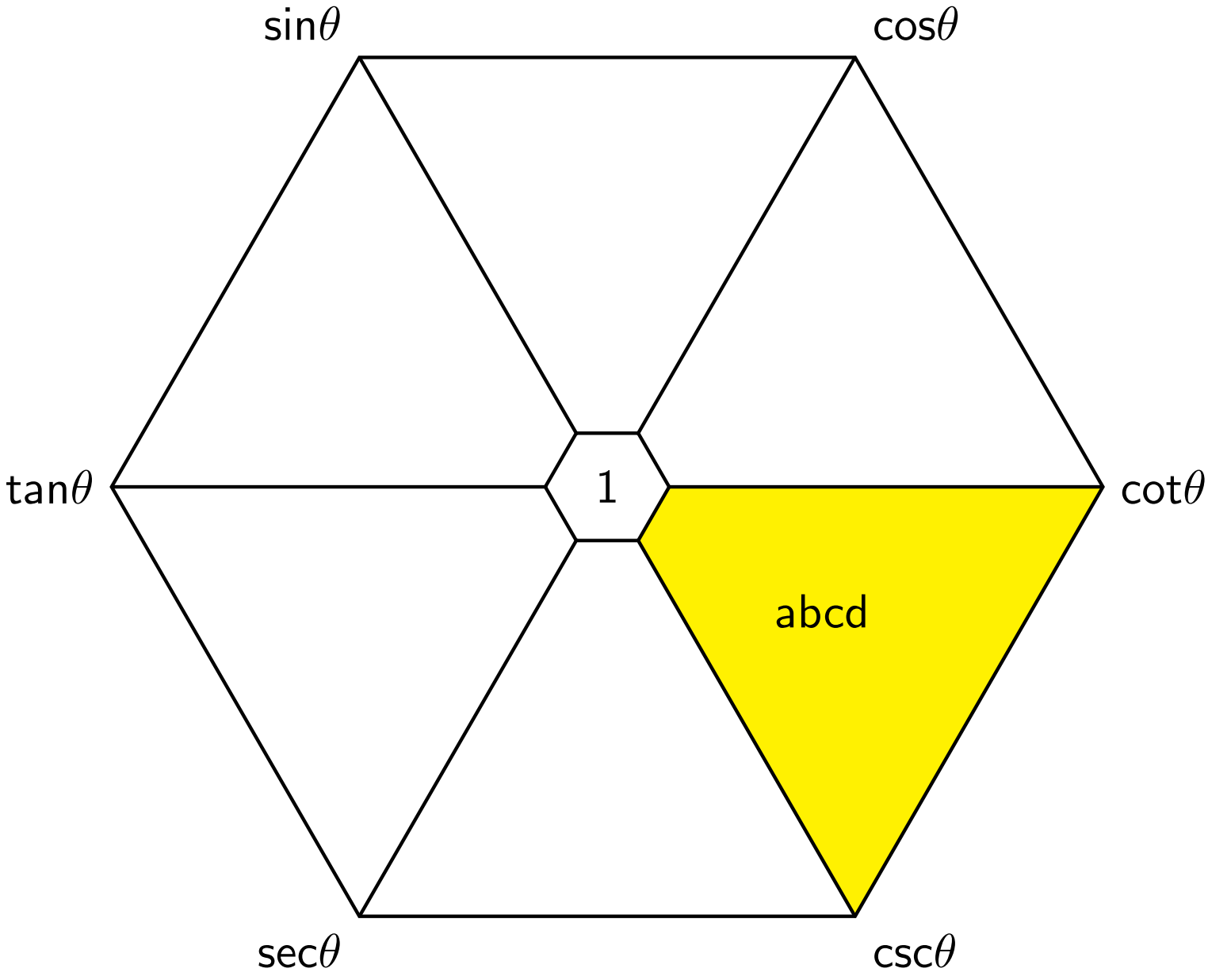
Example

Simplify:

a) csc

Practice

$sec\theta$	$sec\theta$	$sec\theta$	$sec\theta$
$sec\theta$	$sec\theta$	$sec\theta$	$sec\theta$


sinθ
cosθ
tanθ
1
cotθ
abcd
secθ
cscθ