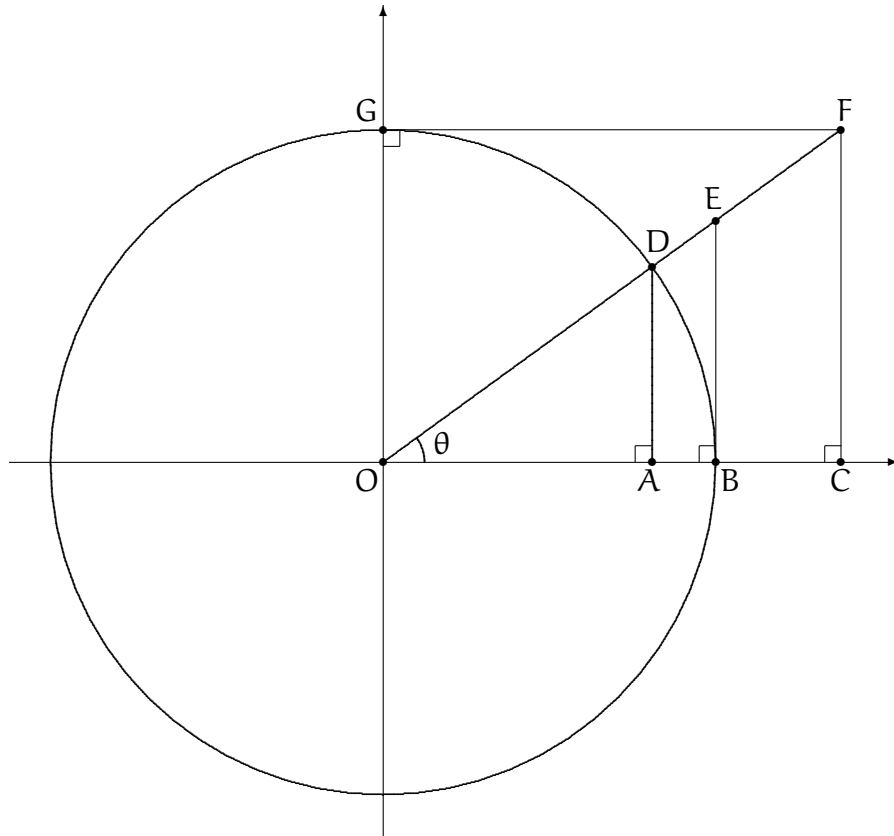


Unit Circle Trigonometry



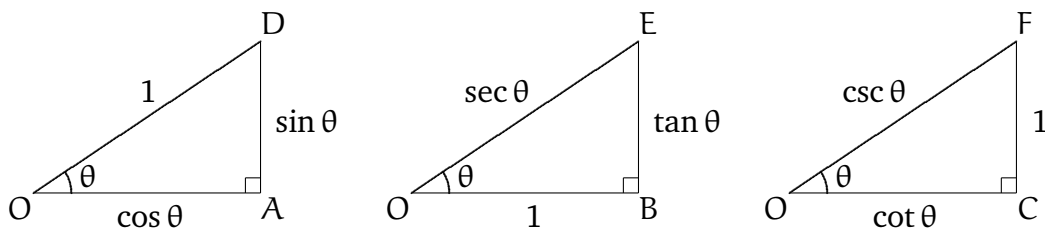
We consider a circle centered at point O of radius one. We define:

$$\begin{array}{lll} OA = \cos \theta & AD = \sin \theta & BE = \tan \theta \\ OE = \sec \theta & OF = \csc \theta & GF = \cot \theta \end{array}$$

We can then deduce the three identities:

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

by applying Pythagoras theorem to the triangles OAD , OBE , and OCF .



Using similar triangles we can deduce the following identities.

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