All Trigonometric Functions have period 2π. Let u be any real number.

$$\sin(u) = 1/\csc(u) \qquad \cos(u) = 1/\sec(u) \qquad \tan(u) = 1/\cot(u) = \sin(u)/\cos(u)$$
$$\csc(u) = 1/\sin(u) \qquad \sec(u) = 1/\cos(u) \qquad \cot(u) = 1/\tan(u) = \cos(u)/\sin(u)$$

$$\sin(\pi/2 - u) = \cos(u) \qquad \cos(\pi/2 - u) = \sin(u) \qquad \tan(\pi/2 - u) = \cot(u)$$
$$\csc(\pi/2 - u) = \sec(u) \qquad \sec(\pi/2 - u) = \csc(u) \qquad \cot(\pi/2 - u) = \tan(u)$$

$$\sin(-u) = -\sin(u) \qquad \cos(-u) = \cos(u) \qquad \tan(-u) = -\tan(u)$$
$$\csc(-u) = -\csc(u) \qquad \sec(-u) = \sec(u) \qquad \cot(-u) = -\cot(u)$$

Pythagorean-Properties:

$$\sin^2(u) + \cos^2(u) = 1$$
$$\sec^2(u) - \tan^2(u) = 1$$
$$\csc^2(u) - \cot^2(u) = 1$$

and Half-Angles:

$$\sin^2(u) = \frac{1 - \cos(2u)}{2}$$
$$\cos^2(u) = \frac{1 + \cos(2u)}{2}$$
$$\tan^2(u) = \frac{1 - \cos(2u)}{1 + \cos(2u)}$$

Sums-and-Differences:

$$\sin(u + v) = \sin(u) \cdot \cos(v) + \cos(u) \cdot \sin(v)$$
$$\sin(u - v) = \sin(u) \cdot \cos(v) - \cos(u) \cdot \sin(v)$$
$$\cos(u + v) = \cos(u) \cdot \cos(v) - \sin(u) \cdot \sin(v)$$
$$\cos(u - v) = \cos(u) \cdot \cos(v) + \sin(u) \cdot \sin(v)$$

and Double-Angles:

$$\sin(2u) = 2\cos(u)\sin(u)$$
$$\cos(2u) = \cos^2(u) - \sin^2(u) = 2\cos^2(u) - 1 = 1 - 2\sin^2(u)$$

$$\tan(u+v) = \frac{\tan(u) + \tan(v)}{1 - \tan(u) \cdot \tan(v)} \qquad \tan(u-v) = \frac{\tan(u) - \tan(v)}{1 + \tan(u) \cdot \tan(v)} \qquad \tan(2u) = 2\left(\frac{\tan(u)}{1 - \tan^2(u)}\right)$$

Sum-to-Product Transforms:

$$\sin(u) + \sin(v) = +2\left[\sin\left(\frac{u+v}{2}\right) \cdot \cos\left(\frac{u-v}{2}\right)\right]$$
$$\sin(u) - \sin(v) = +2\left[\cos\left(\frac{u+v}{2}\right) \cdot \sin\left(\frac{u-v}{2}\right)\right]$$
$$\cos(u) + \cos(v) = +2\left[\cos\left(\frac{u+v}{2}\right) \cdot \cos\left(\frac{u-v}{2}\right)\right]$$
$$\cos(u) - \cos(v) = -2\left[\sin\left(\frac{u+v}{2}\right) \cdot \sin\left(\frac{u-v}{2}\right)\right]$$

and Product-to-Sum Transforms:

$$\sin(u) \cdot \cos(v) = +\frac{1}{2}\left[\sin(u+v) + \sin(u-v)\right]$$
$$\cos(u) \cdot \sin(v) = +\frac{1}{2}\left[\sin(u+v) - \sin(u-v)\right]$$
$$\cos(u) \cdot \cos(v) = +\frac{1}{2}\left[\cos(u+v) + \cos(u-v)\right]$$
$$\sin(u) \cdot \sin(v) = -\frac{1}{2}\left[\cos(u+v) - \cos(u-v)\right]$$