(1) Print on hard stock paper. (2) Cut along lines. (3) Single hole punch upper right side. (4) String on circular key chain.

Inverse Sine

$\sin\,\theta = c \Leftrightarrow$

$\theta = \sin^{-1} c \quad \text{(QI or QIV)}$

$\theta = \pi - \sin^{-1} c \quad \text{(QII or QIII)}$

Coterminal angles:

$\theta = \sin^{-1}\theta \pm 2\pi n$

$\theta = \pi - \sin^{-1}\theta \pm 2\pi n$

$n \in +\mathbb{Z}$

$$\sin = \frac{\text{opp.}}{\text{hyp.}}$$

$$\csc = \frac{\text{hyp.}}{\text{opp.}}$$

Inverse Tangent

$\tan\,\theta = c \Leftrightarrow$

$\theta = \tan^{-1} c \quad \text{(QI or QIV)}$

$\theta = \tan^{-1} c + \pi \quad \text{(QII or QIII)}$

Coterminal angles:

$\theta = \tan^{-1} c \pm \pi n$

$n \in +\mathbb{Z}$

$$\tan = \frac{\text{opp.}}{\text{adj.}}$$

$$\cot = \frac{\text{adj.}}{\text{opp.}}$$

Inverse Cosine

$\cos\theta = c \Leftrightarrow$

$\theta = \cos^{-1} c \quad$ (QI or QII)

$\theta = -\cos^{-1} c + 2\pi \quad$ (QIII or QIV)

Coterminal angles:

$\theta = \cos^{-1} c \pm 2\pi n$

$\theta = -\cos^{-1} c \pm 2\pi n$

$n \in +\mathbb{Z}$

$$\cos = \frac{\text{adj.}}{\text{hyp.}}$$

$$\sec = \frac{\text{hyp.}}{\text{adj.}}$$

Law of Sines

Unknown sides: $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

Unknown angles: $\dfrac{\sin A}{a} = \dfrac{\sin B}{b} = \dfrac{\sin C}{c}$

Applicable only if ASA, AAS or ASS

Law of Cosines

$$\text{ASS or SAS} \Rightarrow c^2 = a^2 + b^2 - 2ab\cos C$$

$$\text{SSS} \Rightarrow \cos C = \frac{c^2 - a^2 - b^2}{-2ab}$$

or

$$C = \cos^{-1}\left(\frac{c^2 - a^2 - b^2}{-2ab}\right)$$

Heron's Triangle Area Theorem

Triangle with sides a, b, & c and

$$s = \frac{a+b+c}{2} \Rightarrow$$

$$A = \sqrt{s(s-a)(s-b)(s-c)}$$

SAS Triangle Area Formula

Triangle with sides a, b, & c and included angle $C \Rightarrow$

$$A = \frac{1}{2} ab \sin C$$

Pythagorean Identities

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

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

$$\cot^2\theta + 1 = \csc^2\theta$$

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

Odd-Even (Negative) Identities

$$\text{Even function} \Rightarrow \cos\theta = \cos(-\theta)$$

$$\text{Odd function} \Rightarrow -\sin\theta = \sin(-\theta)$$

$$\text{Odd function} \Rightarrow -\tan\theta = \tan(-\theta)$$

Sum/Difference Identities

$$\cos(\alpha+\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$$

$$\cos(\alpha-\beta) = \cos\alpha\cos\beta + \sin\alpha\sin\beta$$

$$\sin(\alpha+\beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta$$

$$\sin(\alpha-\beta) = \sin\alpha\cos\beta - \cos\alpha\sin\beta$$

$$\tan(\alpha+\beta) = \frac{\tan\alpha + \tan\beta}{1 - \tan\alpha\tan\beta}$$

$$\tan(\alpha-\beta) = \frac{\tan\alpha - \tan\beta}{1 + \tan\alpha\tan\beta}$$

Double-Angle Identities

$$\sin(2\theta) = 2\sin\theta\cos\theta$$

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

$$\tan(2\theta) = \frac{2\tan\theta}{1-\tan^2\theta}$$

Half-Angle Identities

$$\sin\left(\frac{\theta}{2}\right) = \pm\sqrt{\frac{1-\cos\theta}{2}}$$

$$\cos\left(\frac{\theta}{2}\right) = \pm\sqrt{\frac{1+\cos\theta}{2}}$$

$$\tan\left(\frac{\theta}{2}\right) = \frac{\sin\theta}{1+\cos\theta}$$

Product Identities

$$\cos\alpha\cos\beta = \frac{1}{2}\left[\cos(\alpha-\beta)+\cos(\alpha+\beta)\right]$$

$$\sin\alpha\sin\beta = \frac{1}{2}\left[\cos(\alpha-\beta)-\cos(\alpha+\beta)\right]$$

$$\sin\alpha\cos\beta = \frac{1}{2}\left[\sin(\alpha-\beta)+\sin(\alpha+\beta)\right]$$

$$\cos\alpha\sin\beta = \frac{1}{2}\left[\sin(\alpha+\beta)-\sin(\alpha-\beta)\right]$$