Sequences & Series:

Arithmetic: $u_n = u_1 + (n-1)d$ $\qquad S_n = \frac{n}{2}(u_1 + u_n)$

$S_n = \frac{n}{2}(2u_1 + (n-1)d)$

Geometric: $u_n = u_1 r^{n-1}$ $\qquad S_n = \frac{u_1(r^n - 1)}{r-1}, r \neq 1$

$S_\infty = \frac{u_1}{1-r}, \ |r| < 1, r \neq 0$

Trigonometry:

$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$ $\qquad a^2 = b^2 + c^2 - 2bc\cos A$

$arclength = r\theta$ $\qquad Area_{sector} = \frac{1}{2}r^2\theta$

$A_\Delta = \frac{1}{2}bh = \frac{1}{2}bc\sin\theta$

Pythagorean Identities:

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

Reciprocal and Quotient Identities:

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

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

Addition Identities:

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

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

Double-Angle Identities:

$\cos 2\theta = \cos^2\theta - \sin^2\theta$ $\qquad \sin 2\theta = 2\sin\theta\cos\theta$

$= 2\cos^2\theta - 1$

$= 1 - 2\sin^2\theta$