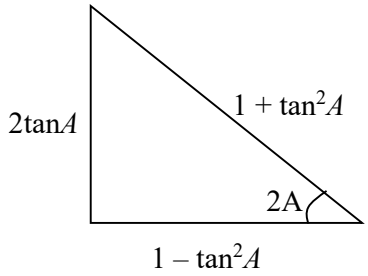
Trigonometry Formula 三角公式

1. $l = r\theta$
2. $S = \frac{1}{2}r^2\theta$
3. $\sin^2 A + \cos^2 A = 1$
4. $1 + \tan^2 A = \sec^2 A$
5. $1 + \cot^2 A = \operatorname{cosec}^2 A$
6. $\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$
   $\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$
   $$\tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$$
7. $\sin 2A = 2\sin A \cos A$
   $$= \frac{2\tan A}{1 + \tan^2 A}$$
8. $\cos 2A = \cos^2 A - \sin^2 A$
   $= 2\cos^2 A - 1$
   $= 1 - 2\sin^2 A$
   $$= \frac{1 - \tan^2 A}{1 + \tan^2 A}$$



9. $$\tan 2A = \frac{2\tan A}{1 - \tan^2 A}$$
10. $\sin 3A = 3\sin A - 4\sin^3 A$
    $\cos 3A = 4\cos^3 A - 3\cos A$
11. $$\sin A + \sin B = 2\sin\frac{A+B}{2}\cos\frac{A-B}{2}$$
    $$\sin A - \sin B = 2\cos\frac{A+B}{2}\sin\frac{A-B}{2}$$
    $$\cos A + \cos B = 2\cos\frac{A+B}{2}\cos\frac{A-B}{2}$$
    $$\cos A - \cos B = -2\sin\frac{A+B}{2}\sin\frac{A-B}{2}$$
12. $2\sin A \cos B = \sin(A + B) + \sin(A - B)$
    $2\cos A \sin B = \sin(A + B) - \sin(A - B)$
    $2\cos A \cos B = \cos(A + B) + \cos(A - B)$
    $-2\sin A \sin B = \cos(A + B) - \cos(A - B)$
13. $$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} = 2R$$ (Sine Rule 正弦定律)
14. $a^2 = b^2 + c^2 - 2bc\cos A$ (Cosine Rule 余弦定律)
15. $\Delta = \frac{1}{2}ab\sin C$
    $$= \sqrt{s(s-a)(s-b)(s-c)}$$
    $$= rs \quad , \qquad s = \frac{a+b+c}{2}$$
16. $a\sin x \pm b\cos x \equiv R\sin(x \pm \alpha)$
    $a\cos x \pm b\sin x \equiv R\cos(x \mp \alpha)$
17. $\sin^{-1}x + \cos^{-1}x = \frac{\pi}{2}$
    $\tan^{-1}x + \cot^{-1}x = \frac{\pi}{2}$