

TRIG PROOFS

Set your
work out
properly!

①

$$\tan 3x \equiv \frac{3 \tan x - \tan^3 x}{1 - 3 \tan^2 x}$$

②

$$\frac{\sqrt{2-2\cos x}}{\sin x} \equiv \sec \frac{x}{2}$$

③

$$\sin^4 \theta + \cos^4 \theta \equiv \frac{1}{2}(2 - \sin^2 2\theta)$$

④

$$\cos^2 x + \sin^2 x \equiv 1$$

⑤

$$\frac{\cos 2x}{\sqrt{1+\sin 2x}} \equiv \cos x - \sin x$$

⑥

$$\cos 6x \equiv 32 \cos^6 x - 48 \cos^4 x + 18 \cos^2 x - 1$$

⑦

$$\sin^2 \theta \tan \theta + \cos^2 \theta \cot \theta + 2 \sin \theta \cos \theta \equiv \tan \theta + \cot \theta$$

⑧

$$\sin \theta (1 + \tan \theta) + \cos \theta (1 + \cot \theta) \equiv \sec \theta + \operatorname{cosec} \theta$$

⑨

$$\sin^4 \theta + \cos^4 \theta \equiv \frac{1}{4}(3 + \cos 4\theta)$$

⑩

$$32 \sin^2 x \cos^4 x \equiv 2 + \cos 2x - 2 \cos 4x - \cos 6x$$

⑪

$$\frac{\sin 4\theta - 8 \sin^3 \theta \cos \theta}{\sin \theta} \equiv 4 \cos 3\theta$$