

# Proving Trigonometric Identities

Just like Chapter 6 had 'provey' and 'solvey' questions, we also get the 'provey' questions in Chapter 7. Just use the appropriate double angle or addition formula.

Prove that  $\tan 2\theta \equiv \frac{2}{\cot \theta - \tan \theta}$

Prove that  $\frac{1 - \cos 2\theta}{\sin 2\theta} \equiv \tan \theta$

# Test Your Understanding

[OCR] Prove that  $\cot 2x + \operatorname{cosec} 2x \equiv \cot x$

[OCR] By writing  $\cos x = \cos\left(2 \times \frac{x}{2}\right)$  or otherwise, prove the identity  $\frac{1-\cos x}{1+\cos x} \equiv \tan^2\left(\frac{x}{2}\right)$

# Very Challenging Exam Example

## Edexcel C3 June 2015 Q8

(a) Prove that

$$\sec 2A + \tan 2A \equiv \frac{\cos A + \sin A}{\cos A - \sin A}, \quad A \neq \frac{(2n+1)\pi}{4}, \quad n \in \mathbb{Z} \quad (5)$$

(b) Hence solve, for  $0 \leq \theta < 2\pi$ ,

$$\sec 2\theta + \tan 2\theta = \frac{1}{2}$$

Give your answers to 3 decimal places.

(4)