Solving Trigonometric Equations

This is effectively the same type of question you encountered in Chapter 6 and in Year 1, except you may need to use either the **addition formulae or double angle formulae.**

[Textbook] Solve $3 \cos 2x - \cos x + 2 = 0$ for $0 \leq x \leq 360°$.

Further Examples

[Textbook] By noting that $3A = 2A + A$, :
a) Show that $\sin(3A) = 3 \sin A - 4 \sin^3 A$.
b) Hence or otherwise, solve, for $0 < \theta < 2\pi$, the equation $16 \sin^3 \theta - 12 \sin \theta - 2\sqrt{3} = 0$

Fro Exam Note: A question pretty much just like this came up in an exam once.

[Textbook] Solve $4 \cos(\theta - 30°) = 8\sqrt{2} \sin \theta$ in the range $0 \leq \theta < 360°$.

Test Your Understanding

6. (i) Without using a calculator, find the exact value of

$$(\sin 22.5° + \cos 22.5°)^2.$$

You must show each stage of your working.

(5)

(ii) (a) Show that $\cos 2\theta + \sin \theta = 1$ may be written in the form

$$k \sin^2 \theta - \sin \theta = 0, \text{ stating the value of } k.$$

(2)

(b) Hence solve, for $0 \le \theta < 360°$, the equation

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

(4)

[Textbook] Solve $2 \tan 2y \tan y = 3$ for $0 \leq y < 2\pi$, giving your answer to 2dp.