

6.1 Beware The Multi-Angle



Suppose that the following trigonometric equation is to be solved;

$$2 \sin(2x) = -\sqrt{3}, \quad 0 \leq x \leq 360^\circ$$

This equation contains a Multi-Angle, the $2x$, buried inside the \sin function. The Teaching Video shows how to solve this equation and the importance of ignoring the Multi-Angle until the very end of the solution.

Teaching Video : <http://www.NumberWonder.co.uk/v9044/6.mp4>



6.2 Exercise

*Any solution based entirely on graphical
or numerical methods is not acceptable*

Marks Available : 30

Question 1

Find all solutions to the following equation for $0 \leq x \leq 360^\circ$

$$4 \cos(2x) = -3$$

Give your answers to one decimal place.

[6 marks]

Question 2

A-Level Examination Question from June 2005, Paper C2, Q5b edited (Edexcel)

Solve $\cos(2x) = -0.9$ for $0^\circ \leq x \leq 360^\circ$

Give your answers to one decimal place.

[4 marks]

Question 3

A-Level Examination Question from June 2008, Paper C2, Q9b edited (Edexcel)

Solve

$$\cos(3x) = -\frac{1}{2} \qquad 0^\circ \leq x \leq 360^\circ$$

[6 marks]

Question 4

Solve the equation $\sin^3(2x) = \frac{1}{8}$ for $0^\circ \leq x \leq 360^\circ$

[6 marks]

Question 5

$$\tan^2(3x) = 2 \tan(3x) - 1 \qquad 0^\circ \leq x \leq 360^\circ$$

[8 marks]

This document is a part of a **Mathematics Community Outreach Project** initiated by Shrewsbury School

It may be freely duplicated and distributed, unaltered, for non-profit educational use

In October 2020, Shrewsbury School was voted "**Independent School of the Year 2020**"

© 2021 Number Wonder

Teachers may obtain detailed worked solutions to the exercises by email from mhh@shrewsbury.org.uk