



QUESTION WORKBOOK

Compound angles and the harmonic form

Trigonometry · Year 12–13

7 questions · 30 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

A1 Find the exact value of $\cos 75^\circ$. [2]

A2 Given that $\sin A = 3/5$ and A is acute, find the exact value of $\sin 2A$. [3]

SECTION B · Standard

B1 Given that $\cos A = 1/3$ and A is acute, find the exact values of $\cos 2A$ and $\sin 2A$. [5]

- B2** Express $5 \sin \theta + 12 \cos \theta$ in the form $R \sin (\theta + \alpha)$, where $R > 0$ and $0 < \alpha < \pi/2$, giving α to 3 decimal places. Hence write down the maximum value of $5 \sin \theta + 12 \cos \theta$ and find, to 3 decimal places, the smallest positive value of θ at which that maximum occurs. [6]

- B3** Solve $\sin 2x = \sin x$ for $0 \leq x < 360^\circ$. [4]

SECTION C · Stretch

C1 Solve $3 \cos \theta - 4 \sin \theta = 2$ for $0 \leq \theta < 2\pi$, giving your answers to 3 decimal places.

[6]

C2 Show that $\sin(A + B) + \sin(A - B) = 2 \sin A \cos B$. Hence find the exact value of $\sin 75^\circ + \sin 15^\circ$.

[4]