



QUESTION WORKBOOK

Compound angles and the harmonic form

Trigonometry · Year 12–13

7 questions · 20 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

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

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

SECTION B · Standard

B1 Given that $\cos A = 1/3$, find the exact value of $\cos 2A$. [3]

B2 Express $5 \sin \theta + 12 \cos \theta$ in the form $R \sin (\theta + \alpha)$, with $R > 0$ and $0 < \alpha < \pi/2$, and write down the maximum value of the expression and the smallest positive θ at which it occurs. [4]

B3 Solve $\sin 2x = \sin x$ for $0 \leq x < 360^\circ$. [3]

SECTION C · Stretch

C1 Express $3 \cos \theta - 4 \sin \theta$ in the form $R \cos (\theta + \alpha)$, with $R > 0$ and $0 < \alpha < \pi/2$, and write down the minimum value of the expression. [3]

C2 Show that $\sin (A + B) + \sin (A - B) = 2 \sin A \cos B$, and use the result to find the exact value of $\sin 75^\circ + \sin 15^\circ$. [3]