InkMaths

QUESTION WORKBOOK

Compound angles and the harmonic form

Trigonometry · Year 12–13

7 questions · 30 marks

PRINT EDITION

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SECTION A · Warm-up

A1 Find the exact value of cos 75°. [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 $0 \leq x < 360°$. [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 $\sin 75° + \sin 15°$. [4]