Edexcel A level Maths Trigonometric identities

Topic assessment

1. Solve the equation $\sin(x+30°) = 2\cos(x+45)°$ for $0° \le x \le 360°$. [5]

2. If $4\cos 2x - 2\cos x + 1 = 0$, find values for x in the range $0° \le x \le 360°$. [6]

3. Write $3\cos\theta + 5\sin\theta$ in the form $R\cos(\theta-\alpha)$ where $R > 0$ and $0° < \alpha < 90°$, and hence solve the equation $3\cos\theta + 5\sin\theta = 2$ in the range $0° \le \theta \le 360°$. [8]

4. Prove that $\dfrac{\sin 2x - \cos 2x + 1}{\sin 2x + \cos 2x + 1} \equiv \tan x$. [5]

5. (i) Write $\sin 3x$ in terms of $\sin x$. [4]
   (ii) Solve $\sin 3x = \sin^2 x$ for $0° \le x \le 360°$. [5]

6. (i) Prove that $4\left(\sin^4 x + \cos^4 x\right) \equiv \cos 4x + 3$ [6]
   (ii) Solve the equation $\sin^4 x + \cos^4 x = 0.5$ for $0 \le x \le 2\pi$. [4]

7. Find the minimum value of the expression
   $4\cos x - 3\sin x - 4$.
   Give the smallest possible positive value of x for which this minimum value occurs. [7]

Total 50 marks