Trig Functions and Identities 1

1) Solve the equation

(i) $3\sin x + 5\cos x = 0$ for $0° < x < 360°$, [3]

(ii) $3\tan^2 y - \sec y - 1 = 0$ for $0° < y < 360°$, [5]

2) Show that $\dfrac{1-\cos^2\theta}{\sec^2\theta - 1} = 1 - \sin^2\theta$. [4]

3) **(a)** Find all the angles between 0° and 360° which satisfy

(i) $2\sin x - 3\cos x = 0$, [3]

(ii) $2\sin^2 y - 3\cos y = 0$. [5]

4) Solve

(i) $4\sin x = \cos x$ for $0° < x < 360°$, [3]

(ii) $3 + \sin y = 3\cos^2 y$ for $0° < y < 360°$, [5]

5) **(a)** Given that $\sin x = p$ and $\cos x = 2p$, where x is acute, find the exact value of p and the exact value of $\operatorname{cosec} x$. [3]

(b) Prove that $(\cot x + \tan x)(\cot x - \tan x) = \dfrac{1}{\sin^2 x} - \dfrac{1}{\cos^2 x}$. [3]

6) Show that $\dfrac{1}{1-\cos\theta} + \dfrac{1}{1+\cos\theta} = 2\operatorname{cosec}^2\theta$. [3]

7) Solve

(i) $2\cot^2 x - 5\operatorname{cosec} x - 1 = 0$ for $0° < x < 180°$, [5]

(ii) $5\cos 2y - 4\sin 2y = 0$ for $0° < y < 180°$, [4]