Edexcel A level Maths Trigonometric functions

Topic Assessment

1. Find all of the angles between $0°$ and $360°$ such that
   (i) $\sec x = 2.5$ [2]
   (ii) $\operatorname{cosec} x = -1.5$ [2]

2. Sketch the curve $y = 1 + \sec 2x$ for $0 \leq x \leq 2\pi$.
   Give the equations of the asymptotes and the coordinates of the turning points.
                                                                            [6]

3. Solve the equation $\sec^2 x + \tan x = 1$ for $0 \leq x \leq 2\pi$.   [5]

4. (i) Solve the equation $\cot x = \sin x$ for $0° \leq x \leq 360°$.   [5]
   (ii) Sketch the graphs of $y = \cot x$ and $y = \sin x$ for $0° \leq x \leq 360°$ on the same axes, and indicate the roots found in part (i) on your graph.   [3]

5. A function is defined by $f(x) = 2\cos^{-1} x - 1$.
   (i)   Write down the domain and range of this function.   [2]
   (ii) Find the exact value of f(-0.5).   [2]
   (iii) Find the inverse function $f^{-1}(x)$.   [3]

6. Prove the following identities.
   (i) $(\sec^2 x + \tan^2 x)(\operatorname{cosec}^2 x + \cot^2 x) \equiv 1 + 2\sec^2 x \operatorname{cosec}^2 x$ [5]
   (ii) $\dfrac{\cos x}{1 - \tan x} + \dfrac{\sin x}{1 - \cot x} \equiv \sin x + \cos x$ [5]

Total 40 marks