Trigonometric Functions (Sec, cosec & cot) - Edexcel Past Exam Questions

1. (*a*) Given that $\sin^2\theta + \cos^2\theta \equiv 1$, show that $1 + \tan^2\theta \equiv \sec^2\theta$. **(2)**

(*b*) Solve, for $0 \leq \theta < 360°$, the equation

$$2\tan^2\theta + \sec\theta = 1,$$

giving your answers to 1 decimal place. **(6)**

June 05 Q1

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2. (*a*) Using $\sin^2\theta + \cos^2\theta \equiv 1$, show that the $\text{cosec}^2\theta - \cot^2\theta \equiv 1$. **(2)**

(*b*) Hence, or otherwise, prove that

$$\text{cosec}^4\theta - \cot^4\theta \equiv \text{cosec}^2\theta + \cot^2\theta$$ **(2)**

(*c*) Solve, for $90° < \theta < 180°$,

$$\text{cosec}^4\theta - \cot^4\theta = 2 - \cot\theta.$$ **(6)**

June 06 Q6

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3. (i) Prove that

$$\sec^2 x - \text{cosec}^2 x \equiv \tan^2 x - \cot^2 x.$$ **(3)**

(ii) Given that

$$y = \arccos x, \quad -1 \leq x \leq 1 \quad \text{and} \quad 0 \leq y \leq \pi,$$

(*a*) express $\arcsin x$ in terms of y. **(2)**

(*b*) Hence evaluate $\arccos x + \arcsin x$. Give your answer in terms of π. **(1)**

Jan 07 Q8

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4. (*a*) Given that $\sin^2\theta + \cos^2\theta \equiv 1$, show that $1 + \cot^2\theta \equiv \text{cosec}^2\theta$. **(2)**

(*b*) Solve, for $0 \leq \theta < 180°$, the equation

$$2\cot^2\theta - 9\,\text{cosec}\,\theta = 3,$$

giving your answers to 1 decimal place. **(6)**

June 08 Q5

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5 Find, for $0 < x < \pi$, all the solutions of the equation

$$\operatorname{cosec} x - 8 \cos x = 0.$$

giving your answers to 2 decimal places. **(5)**

June 09 Q8*(edited)*

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6. (*a*) Use the identity $\cos^2 \theta + \sin^2 \theta = 1$ to prove that $\tan^2 \theta = \sec^2 \theta - 1$.

(2)

(*b*) Solve, for $0 \leq \theta < 360°$, the equation

$$2 \tan^2 \theta + 4 \sec \theta + \sec^2 \theta = 2.$$ **(6)**

June 09 Q2
