Given that $x = \frac{2}{cos\theta}$ and $y = 3tan\theta$

Show that $\frac{x^2}{4} - \frac{y^2}{9} = 1$

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a)

$$\frac{x^2}{4} - \frac{y^2}{9} = \frac{(\frac{2}{cos\theta})^2}{4} - \frac{(3tan\theta)^2}{9}$$

$$\frac{x^2}{4} - \frac{y^2}{9} = \frac{\frac{4}{cos^2\theta}}{4} - \frac{9tan^2\theta}{9}$$

$$\frac{x^2}{4} - \frac{y^2}{9} = \frac{4}{4cos^2\theta} - tan^2\theta$$

$$\frac{x^2}{4} - \frac{y^2}{9} = \frac{1}{cos^2\theta} - tan^2\theta$$

$$\frac{x^2}{4} - \frac{y^2}{9} = \frac{1}{cos^2\theta} - \frac{sin^2\theta}{cos^2\theta}$$

$$\frac{x^2}{4} - \frac{y^2}{9} = \frac{1 - sin^2\theta}{cos^2\theta}$$

$cos^2\theta + sin^2\theta \equiv 1$

$cos^2\theta \equiv 1 - sin^2\theta$

$$\frac{x^2}{4} - \frac{y^2}{9} = \frac{1 - sin^2\theta}{1 - sin^2\theta}$$

$$\frac{x^2}{4} - \frac{y^2}{9} = 1$$