

4 (a) (i) By using a suitable trigonometric identity, show that the equation

$$\sin \theta \tan \theta = 4 \cos \theta$$

can be written as

$$\tan^2 \theta = 4$$

[1 mark]

4 (a) (ii) Hence solve the equation

$$\sin \theta \tan \theta = 4 \cos \theta$$

where $0^\circ < \theta < 360^\circ$

Give your answers to the nearest degree.

[3 marks]

4 (b) Deduce all solutions of the equation

$$\sin 3\alpha \tan 3\alpha = 4 \cos 3\alpha$$

where $0^\circ < \alpha < 180^\circ$

Give your answers to the nearest degree.

[3 marks]