

8 (a) (i) Show that the equation

$$3 \sin \theta \tan \theta = 5 \cos \theta - 2$$

is equivalent to the equation

$$(4 \cos \theta - 3)(2 \cos \theta + 1) = 0$$

[3 marks]

8 (a) (ii) Solve the equation

$$3 \sin \theta \tan \theta = 5 \cos \theta - 2$$

for $-180^\circ \leq \theta \leq 180^\circ$

[2 marks]

8 (b) Hence, deduce all the solutions of the equation

$$3 \sin\left(\frac{1}{2}\theta\right) \tan\left(\frac{1}{2}\theta\right) = 5 \cos\left(\frac{1}{2}\theta\right) - 2$$

for $-180^\circ \leq \theta \leq 180^\circ$, giving your answers to the nearest degree.

[2 marks]