

12.

**In this question you must show detailed reasoning.**

**Solutions relying entirely on calculator technology are not acceptable.**

(a) Show that the equation

$$4 \tan x = 5 \cos x$$

can be written as

$$5 \sin^2 x + 4 \sin x - 5 = 0 \tag{3}$$

(b) Hence solve, for  $0 < x \leq 360^\circ$

$$4 \tan x = 5 \cos x$$

giving your answers to one decimal place.

**(4)**

(c) Hence find the **number of solutions** of the equation

$$4 \tan 3x = 5 \cos 3x$$

in the interval  $0 < x \leq 1800^\circ$ , explaining briefly the reason for your answer.

**(2)**