

9.

In this question you must show all stages of your working.

Solutions relying entirely on calculator technology are not acceptable.

(a) Show that

$$5 \cos \theta = 24 \tan \theta$$

can be written as

$$5 \sin^2 \theta + 24 \sin \theta - 5 = 0 \tag{4}$$

(b) Hence solve, for $-180^\circ \leq x < 540^\circ$

$$5 \cos x = 24 \tan x$$

giving your answers to one decimal place. (3)

(c) Deduce the number of solutions in the interval $-180^\circ \leq x < 540^\circ$ of the equation

$$5 \cos(8x) = 24 \tan(8x) \tag{1}$$