8 The variables x and θ satisfy the differential equation

$$\sin 2\theta \frac{\mathrm{d}x}{\mathrm{d}\theta} = (4x+3)\cos 2\theta,$$

and $x = 0$ when $\theta = \frac{1}{12}\pi$.

Solve the differential equation and obtain an expression for x in terms of θ. [7]