The variables x and y satisfy the differential equation

$$(1 - \cos x)\frac{\mathrm{d}y}{\mathrm{d}x} = y \sin x.$$

It is given that $y = 4$ when $x = \pi$.

(a) Solve the differential equation, obtaining an expression for y in terms of x. [6]

(b) Sketch the graph of y against x for $0 < x < 2\pi$. [1]