

**12 (a)** Show that the equation

$$2 \cot^2 x + 2 \operatorname{cosec}^2 x = 1 + 4 \operatorname{cosec} x$$

can be written in the form

$$a \operatorname{cosec}^2 x + b \operatorname{cosec} x + c = 0$$

**[2 marks]**

**12 (b)** Hence, given  $x$  is obtuse and

$$2 \cot^2 x + 2 \operatorname{cosec}^2 x = 1 + 4 \operatorname{cosec} x$$

find the exact value of  $\tan x$

Fully justify your answer.

**[5 marks]**