

8 A curve has equation  $y = 2x \cos 3x + (3x^2 - 4) \sin 3x$

8 (a) Find  $\frac{dy}{dx}$ , giving your answer in the form  $(mx^2 + n) \cos 3x$ , where  $m$  and  $n$  are integers.

**[4 marks]**

8 (b) Show that the  $x$ -coordinates of the points of inflection of the curve satisfy the equation

$$\cot 3x = \frac{9x^2 - 10}{6x}$$

**[4 marks]**