8 In this question you must show detailed reasoning.

A curve has the following properties.

- The gradient of the curve is given by $\frac{dy}{dx} = 2x + 3$.
- The curve passes through the points $(2, a)$ and $(3, 2a)$ where a is a constant.

Find the coordinates of the points where the curve meets the line $y = 4x + 4$. **[7]**