

The polynomial  $p(x)$  is defined by

$$p(x) = 2x^3 + ax^2 - 3x - 4,$$

where  $a$  is a constant. It is given that  $(x - 4)$  is a factor of  $p(x)$ .

- (a) Find the value of  $a$  and hence factorise  $p(x)$ . [4]

[illegible]

**(b)** Show that the equation  $p(e^{3y}) = 0$  has only one real root and find its exact value. [3]

This image shows a full page of white paper with horizontal dashed lines, typical of primary school handwriting practice paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.