

(a) Find the coordinates of the minimum point of the curve, giving your answer in terms of  $k$ . [4]

[illegible]

The tangent at the point on the curve where  $x = 4k^2$  intersects the y-axis at  $P$ .

- (b)** Find the  $y$ -coordinate of  $P$  in terms of  $k$ . [4]

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

The shaded region is bounded by the curve, the  $x$ -axis and the lines  $x = \frac{9}{4}k^2$  and  $x = 4k^2$ .

- (c) Find the area of the shaded region in terms of  $k$ . [3]

[illegible]