The diagram shows part of the curve $y = \frac{1}{16}(3x - 1)^2$, which touches the x-axis at the point P. The point $Q\,(3, 4)$ lies on the curve and the tangent to the curve at Q crosses the x-axis at R.

  (i) State the x-coordinate of P.   [1]

Showing all necessary working, find by calculation

  (ii) the x-coordinate of R,   [5]

(iii) the area of the shaded region PQR.   [6]