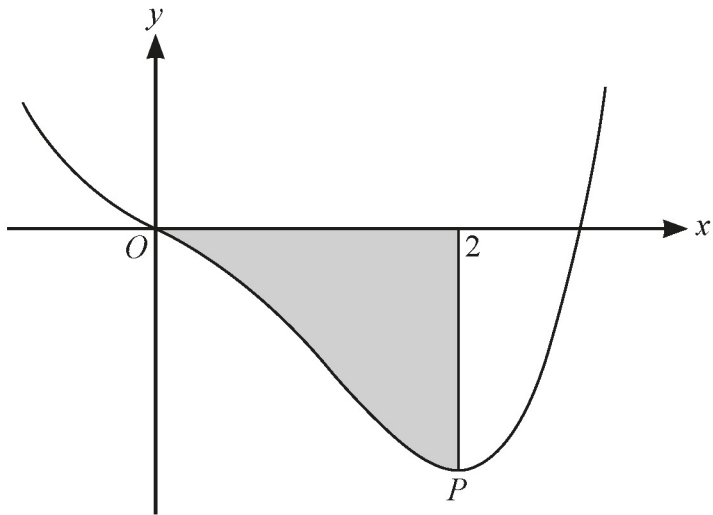**6**

The diagram shows the curve with equation $y = 5x^4 + ax^3 + bx$, where a and b are integers. The curve has a minimum at the point P where $x = 2$.

The shaded region is enclosed by the curve, the x-axis and the line $x = 2$.

Given that the area of the shaded region is 48 units^2, determine the y-coordinate of P. **[7]**