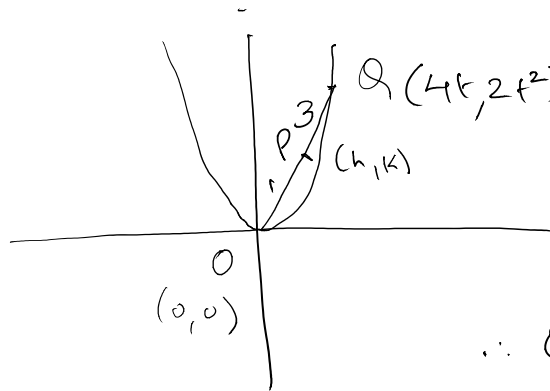


Let O be the vertex and Q be any point on the parabola, $x^2 = 8y$. If the point P divides the line segment OQ internally in the ratio 1 : 3, then the locus of P is :

- (1) $y^2 = 2x$
- ✓ (2) $x^2 = 2y$
- (3) $x^2 = y$
- (4) $y^2 = x$



$x^2 = 8y$
 Parametric coordinates
 $\equiv (4t, 2t^2)$

$\therefore Q \equiv (4t, 2t^2)$

Given: $OP : PQ :: 1 : 3$; Let $P(h, k)$

$\therefore h = \frac{4t}{4} \Rightarrow h = t$

$\& k = \frac{2t^2}{4} \Rightarrow k = \frac{t^2}{2}$

$\therefore 2k = h^2 \Rightarrow x^2 = 2y$

\therefore Correct option is (2)