**10** The normal to the curve $y = \tan\left(3x + \frac{\pi}{2}\right)$ at the point $P$ with coordinates $(p, -1)$, where $0 < p \leqslant \frac{\pi}{6}$, meets the $x$-axis at the point $A$ and the $y$-axis at the point $B$. Find the exact coordinates of the mid-point of $AB$. [10]

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