Problem of the Week

Problem D

Crossing Points in General

Two distinct lines are drawn such that the first line passes through point $P$ on the $y$-axis and the second line passes through point $Q$ on the $x$-axis. Line segment $PQ$ is perpendicular to both lines.

If the line through $P$ has equation $y = mx + k$, then determine the $y$-intercept of the line through $Q$ in terms of $m$ and $k$.

Suggestion: If you are finding the general problem difficult to start, consider first solving a problem with a specific example for the line through $P$, like $y = 4x + 3$, and then attempt the more general problem.