

Consider the parabola  $y = x^2$ . Identify the set of all points  $P$  in the  $xy$ -plane (but not on the parabola) with the following property: There exist exactly two points  $A$  and  $B$  on the parabola such that both lines  $PA$  and  $PB$  are orthogonal to the parabola.

Consider the point  $P = (4, 7/2)$ . Find all lines through this point that are orthogonal to the parabola.

