

**Question (\*\*\*\*\*)**

$$f(x) = b - (x - a)^2, x \in \mathbb{R}$$

$$g(x) = a + (x - b)^2, x \in \mathbb{R}.$$

The graph of  $f(x)$  has a maximum at  $P$  and the graph of  $g(x)$  has a minimum at  $Q$ , where  $P$  and  $Q$  are distinct points.

- Given that  $f(x)$  passes through  $Q$ , show that  $g(x)$  passes through  $P$ .
- Given further that  $f(x)$  touches the  $x$  axis sketch both graphs in the same diagram.

proof/graph

