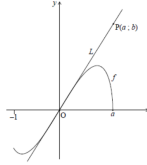


## IB Calculus Problem 6

The following figure shows part of the graph of  $f(x) = 2x\sqrt{a^2 - x^2}$ , for  $-1 \leq x \leq a$ , where  $a > 1$ .

The figure is not to scale.



The line  $L$  is the tangent to the graph of  $f$  at the origin,  $O$ . The point  $P(a; b)$  is on  $L$ .

- Given that  $f'(x) = \frac{2a^2 - 4x^2}{\sqrt{a^2 - x^2}}$ , for  $-1 \leq x \leq a$ , find the equation of  $L$ .
- Hence or otherwise, find an expression for  $b$  in terms of  $a$ .