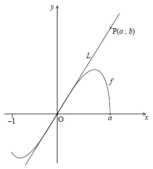
IB Calculus Problem 006

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

A. 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.

B. Hence or otherwise, find an expression for b in terms of a.