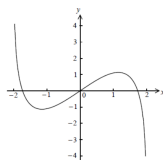


IB Calculus Problem 22

Consider $f(x) = x\ln(4 - x^2)$, with $-2 < x < 2$.

Part of the graph of f is shown below.



Let P and Q be the points on the curve of f where the tangent to the graph of f is parallel to the x -axis.

A.

i. Find the x -coordinates of P and Q .

ii Consider $f(x) = k$.

State all values of k for which there are exactly two solutions.

Let $g(x) = x^3\ln(4 - x^2)$, with $-2 < x < 2$.

B. Show that $g'(x) = \frac{-2x^4}{4 - x^2} + 3x^2\ln(4 - x^2)$.

C. Sketch the graph of g' .

D. Consider $g'(x) = w$.

State all values of w for which there are exactly two solutions.