1. Use the following steps to find the derivative of

\[ f(x) = \sqrt[3]{x^2 + \sin(x)} \]

(i) Find \( f(x+h) \).

(ii) Find \( \frac{f(x+h) - f(x)}{h} \), and simplify.

(iii) Find \( \lim_{h \to 0} \frac{f(x+h) - f(x)}{h} \), explain your result and then verify the answer directly (using an appropriate Maple command.)

2. Find the x-coordinate of points on the graph of

\[ y = 3x^4 + 8x^3 - 24x^2 - 48x + 19 \]

Where the tangent line has slope of 4. Find the equation of the tangent lines at these points. Verify your result by plotting the graph of \( y = f(x) \) along with tangent lines in an appropriate range which includes the (real) x-coordinates you have found above.

Hint: Use an appropriate scale for the y-axis in order to see the entire graph.