Find the solution of the differential equation

\[2Q'' + Q = \cos\left(\frac{2}{3}t\right), Q(0) = 0, Q'(0) = 0.\]

What is the smallest constant \(M\) such that \(|Q(t)| \leq M\) for all \(t\)? Is there a value of \(t\) such that \(Q(t) = M\)?