Create a vector $t$ with 100 uniformly-spaced values from 0 to 5. For every element of $t$, compute the vector $x = \sin(2t) + 0.5\cos(t)$. To find the values of $t$ where $x$ reaches maxima and minima take the following steps.

1. Fit a curve to $x(t)$ using a polynomial of high enough degree to give a “good” fit.
2. Take the derivative of this polynomial to give the slope of the polynomial at every value of $t$.
3. Find the values of $t$ where $x(t)$ has zero slope by computing the roots of the derivative.
4. Keep only the roots that are real-valued.

Put this in a functional form that accepts an arbitrary $t$ and $x$ as inputs and returns an array of $t$ values where the maxima and minima occur. If so, include checking of the inputs to throw an “error” message if the lengths of $t$ and $x$ do not match.