Derivative Calculator

Objective:

Calculate the derivative of several equations.

Complexity level:

* Difficult

Business Scenario:

* The derivative is a useful tool which has real life applications- from determining velocity/ acceleration from a motion equation, or the rate at which something is flowing.

Problem statement

1. A car moves in the path represented by motion equation: f(t) = t3+3t2+2t+1 .
2. Calculate the equations for the velocity and acceleration of the car.
3. Solve for time *t* where the velocity = 0 .
4. Solve for time *t* where the acceleration = 0 .
5. Write an algorithm to calculate the derivative for f(x) = e3x+4x2 and solve for the points where the derivative = 0 .
6. Write an algorithm to calculate the derivative of   (t3+3t2+2t+1)/(t2+6t+5) .
7. Write an algorithm to calculate the derivative of f(x) = 3x.. .

Expectation outcomes:

Practice chain rule and code for the operations of the derivative- a core concept of Calculus I.

Reference URL:

1. Banach, S. (1931), "Uber die Baire'sche Kategorie gewisser Funktionenmengen", Studia. Math. (3): 174–179.. Cited by Hewitt, E; Stromberg, K (1963), Real and abstract analysis, Springer-Verlag, Theorem 17.8 .
2. ["The Notation of Differentiation"](http://web.mit.edu/wwmath/calculus/differentiation/notation.html). MIT. 1998. Retrieved 24 October 2012.