Wronskian Calculator

Objective:

Calculate the first and second derivative of several equations and use the wronskian to determine linear independence.

Complexity level:

* Hard

Business Scenario:

* The Wronskian is a useful matrix which is an extension of the derivative which tests for linear independence.

Problem statement

1. Determine, using an algorithm that calculates the wronskian f(t) = t3+3t2+2t+1, t3+t+4, and t2+4t+10 are independent.
2. Determine, using an algorithm that calculates the wronskian f(t) = t4+8t3+2t3+1, t30+4, and t2+4t+10 are independent.
3. Determine, using an algorithm that calculates the wronskian f(t) = t4+2t2+t, t2+7t+10 are independent .
4. Determine, using an algorithm that calculates the wronskian f(t) = e3t and 3t are independent.

Expectation outcomes:

Practice the wronskian in software form as a useful tool for differential equations.

Reference URL:

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2. Bôcher, Maxime (1901), "Certain cases in which the vanishing of the Wronskian is a sufficient condition for linear dependence", [Transactions of the American Mathematical Society](https://en.wikipedia.org/wiki/Transactions_of_the_American_Mathematical_Society) (Providence, R.I.: [American Mathematical Society](https://en.wikipedia.org/wiki/American_Mathematical_Society)) 2 (2): 139–149, [doi](https://en.wikipedia.org/wiki/Digital_object_identifier):[10.2307/1986214](https://dx.doi.org/10.2307%2F1986214), [ISSN](https://en.wikipedia.org/wiki/International_Standard_Serial_Number) [0002-9947](https://www.worldcat.org/issn/0002-9947), [JFM](https://en.wikipedia.org/wiki/Jahrbuch_%C3%BCber_die_Fortschritte_der_Mathematik) [32.0313.02](https://zbmath.org/?format=complete&q=an:32.0313.02), [JSTOR](https://en.wikipedia.org/wiki/JSTOR) [1986214](https://www.jstor.org/stable/1986214).
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