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|  | Lecture Notes | 16th May 2023 |

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**Variation of parameters:**

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**Solve the following ODE using variation of parameter**:

Example 1:

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First, we solve for the homogeneous case

Varying A to A(x)

Substituting y and y’ in the give ODE we get,

Example 2:

**-----------------------------------------------------------------------------------------------------------------------------**

First, we solve for the homogeneous case

Varying A to A(x)

Substituting y and y’ in the give ODE we get,

Let

**Method of exact equations:**

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Condition for exactness ==>

Solution ==>

Where

It can be proved that since the ODE is exact then all terms of x will be cancelled out in the LHS

Resubstitute in

Solution is

**Solve the following ODE using method of exact equations**:

Example 1:

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First, we check for exactness i.e.,

Here, and

Therefore, the give ODE is exact

Solution is

Where

Example 2:

**-----------------------------------------------------------------------------------------------------------------------------**

First, we check for exactness i.e.,

Here, and

Therefore, the give ODE is exact

Solution is

Where