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Tutorial-3

Examples on Linear Differential Equation

Q. Solve the following

1) $dy/dx + Py = Q y^n$

Ans: C) Bernoullis D.E.

2) $\frac{1}{D} e^{ax} = ?$

Ans: C] e^{ax}/a

3) D.E. $\frac{dx}{dy} + Px = Q$ has integral factors as

Ans: A] $e^{\int P.dx}$

4] For D.E. $f(D)y = 0$, complete solution is

Ans: A] C.F. + P.I.

5] If $D^2(D^2+1)y = 0$ then roots of A.E. are

Ans: B] Only imaginary

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Rules

6) For $\frac{1}{f(D)} e^{ax} = \frac{1}{f(a)} e^{ax}$, but if $f(a)=0$ then

Ans: B] Differentiate $f(D)$

7) How many types of non-repeated roots A.E. has

Ans: C] 2

8) If A.E. has $m_1 = 1+i$, $m_2 = 1-i$ then C.F. is

Ans: D] $e^x (C_1 \cos x + C_2 \sin x)$

9) If C.F. for D.E. is $y = (C_1 + C_2)e^{3x} + C_3$ then roots of A.E. are

Ans: D] 0, -3, -3

10) C.F. $= e^x ((C_1 + C_2 x)\cos\sqrt{2}x + (C_3 + C_4 x)\sin\sqrt{2}x)$ then roots of A.E. are

Ans: D] $i \pm i\sqrt{2}$, $1 \pm i\sqrt{2}$