

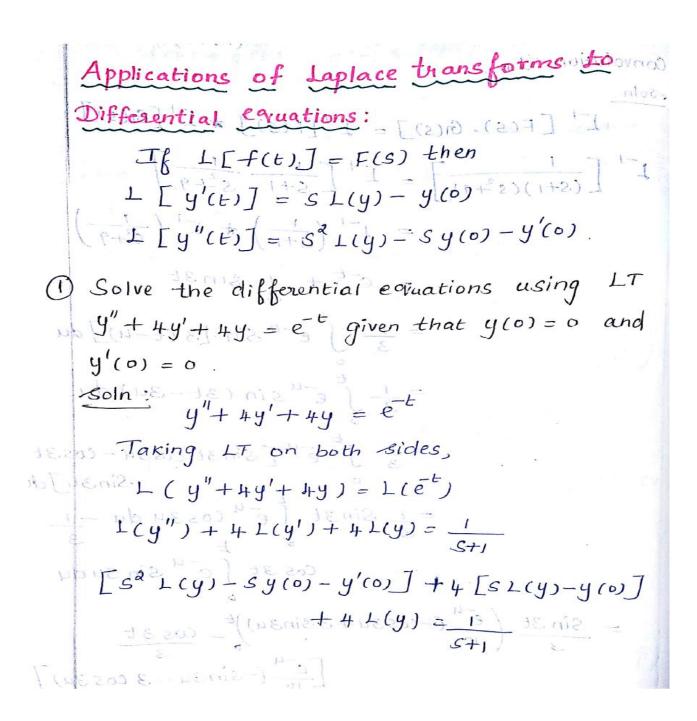
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UNIT 5- Laplace Transform

Application to Solution of linear second order ordinary differential equations with constant coefficients





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Given:
$$y(0) = 0$$
, $y'(0) = 0$

$$\Rightarrow [S^{2} L(y) - Sx0 - 0] + 4 [S L(y) - 0] + 4 L(y)$$

$$\Rightarrow S^{2} L(y) + 4 SL(y) + 4 L(y) = \frac{1}{S+1}$$

$$\Rightarrow (S^{3} + 4S + 1) L(y) = \frac{1}{S+1}$$

$$\Rightarrow L(y) (S+a)^{3} = \frac{1}{S+1}$$

$$= \frac{1}{(S+1)(S+a)^{2}}$$

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$$= A(S+a)^{3} + B(S+a)(S+1) + C(S+1)$$
Put $S = -a \Rightarrow C = -1$
Put $S = 0 \Rightarrow B = -1$

$$= \frac{1}{(S+1)(S+a)^{2}}$$

$$= \frac{1}{(S+1)($$