

SRM Institute of Science and Technology Kattankulathur

DEPARTMENT OF MATHEMATICS

18MAB101T Calculus and Linear Algebra



UNIT –III – Ordinary Differential Equations

Tutorial Sheet -3	Answers
Solve $(D^2 + a^2)y = \tan ax$ by the method of variation of parameter	$y = (c_1 \cos ax + c_2 \sin ax)$
	$-\frac{1}{a^2}\cos ax\log\left[\sec ax + \tan ax\right]$
Solve $(D^2+1)y=\sec ax$ by the method of variation of parameter	$y = (c_1 \cos x + c_2 \sin x)$
	$-\cos x \log(\cos x) + x \sin x$
Solve $(D^2+1)y = \cos ecx$ by the method of variation of parameter	$y = (c_1 \cos x + c_2 \sin x)$
	$+\sin x \log(\sin x) - x\cos x$
Solve $(D^2 + 2D + 5)y = e^{-x} \tan x$ by the method of variation of parameter $y = e^{-x} (c_1 \cos 2x + c_2 \sin 2x)$	
	$+\left[-\frac{1}{2}x + \frac{\sin 2x}{4}\right]e^{-x}\cos 2x$
	$+\left[-\frac{-\cos 2x}{2} + \frac{1}{2}\log(\cos x)\right]e^{-x}\sin 2x$
Solve $\frac{dx}{dt} - y = 0; \frac{dy}{dt} + x = 0$	$x = A\cos t + B\sin t$
dt , dt	$y = -A\sin t + B\cos t$
Solve $\frac{dx}{dt} + y = e^t$; $x - \frac{dy}{dt} = t$	$x = -A\sin t + B\cos t + \frac{1}{2}e^t + t$
	$y = A\cos t + B\sin t + \frac{1}{2}e^t - 1$
$\frac{dx}{dt} + 2x - 3y = t; \frac{dy}{dt} - 3x + 2y = e^{2t}$	$x = Ae^{t} - Be^{-5t} - \frac{2}{5}t + \frac{3}{7}e^{2t} - \frac{13}{25}$
	$x = Ae^{t} + Be^{-5t} - \frac{3}{5}t + \frac{4}{7}e^{2t} - \frac{12}{25}$