

225 Math Exercises

Sections	Numbers of exercises
1-3	1-2-3-4-5-6-7-8-9
2-1	1-3-4-6-7-9-10-11-12-
2-2	2-3-4-8-(only part a and c for 10-11-14-15)- 18-23 Homogeneous Equations: 25 and solve the following equations: 1- $ydx = 2(x + y)dy$ 2- $(y^2 + yx)dx - x^2dy$ 3- $\frac{dy}{dx} = \frac{x+3y}{3x+y}$ 4- $(x^2 + 2y^2)\frac{dx}{dy} = xy, \quad y(-1) = 1$
2-4	1-2-3-4-8- Bernoulli Equations: 23 and solve the following: 1- $x\frac{dy}{dx} + y = \frac{1}{y^2}$ 2- $x\frac{dy}{dx} - (1 + x)y = xy^2$ 3- $y^{\frac{1}{2}}\frac{dy}{dx} + y^{\frac{3}{2}} = 1, \quad y(0) = 4$
2-6	2-3-4-6-7-8-10-11-12-15-16-19-21-22
Orthogonal trajectories	A) Find the orthogonal trajectories of the following equations: $y(x^{2+1}) = cx$ $y^2(2x^2 + y^2) = c^2$ $y = c \sin x$ $y^2 = x^2(1 - cx)$ B) Find the member of the orthogonal trajectories for $x + y = ce^y$ that passes through (0,5).
3-1	
3-2	
3-3	
3-4	
3-5	
3-6	
4-1	
4-2	
4-3	

5-4	
SOLVING SYSTEMS OF LINEAR DEs BY ELIMINATION	
5-1	
5-2	
5-3	
6-1	
6-2	
6-3	