Practice Lesson_10_04_20

Differential Equation- Chapter-I

GROUP I-219ia, 219iбe,219iвe

Classwork	Answers
Find the general solution of the equations:	
2.6. $y' = \dfrac{3x-4y-2}{3x-4y-3}$.	$x-y+C=\ln\lvert 3x-4y+1\rvert$.
2.7. $y' = \dfrac{2x-y+1}{x-2y+1}$.	$x^2-xy+y^2+x-y=C$.
2.14. $(x+y+1)dx=(2x+2y-1)dy$	$x-2y+\ln\lvert x+y\rvert=C$
2.15. $y' = \dfrac{2y-x-5}{2x-y+4}$	$(x+y-1)^2=C(x-y+3)$
Solve the initial-value problem:	
2.16. $(y^2-3x^2)dy+2xydx=0, y(0)=1$	$y^3=y^2-x^2$
2.17. $y\left(\dfrac{dy}{dx}\right)^2+2x\dfrac{dy}{dx}-y=0,\ y(0)=\sqrt{5}$	$y^2=5\pm 2\sqrt{5}x$
Additional Tasks	
2.18. Find the line if square of the length of the segment cut off by any tangent on the ordinate axis is the product of the coordinates of the tangency point.	$x=Ce^{\pm 2\sqrt{\frac{y}{x}}}$
2.19. What surface of revolution is the mirror of projector, if after reflection the light rays from a point source are directed by a parallel beam?	Form of the paraboloid of revolution.

Homework	**Answers**
Find the general solution of the equations:	
6.1. $y' = \dfrac{x^2 + xy + y^2}{x^2}$.	$x = ce^{\arctan\frac{y}{x}}$.
6.4. $x^3 y' = y\left(y^2 + x^2\right)$.	$x = Ce^{-\frac{x^2}{2y^2}}$.
6.5. $\left(x - y\cos\dfrac{y}{x}\right)dx + x\cos\dfrac{y}{x}dy = 0$.	$\sin\dfrac{y}{x} + \ln\lvert x\rvert = C$.
6.6. $\dfrac{dx}{x^2 - xy + y^2} = \dfrac{dy}{2y^2 - xy}$.	$y(y-2x)^3 = C(y-x)^2$.
6.7. $\left(x - 2xy - y^2\right)dy + y^2 dx = 0$.	$x = y^2\left(1 + Ce^{\frac{1}{y}}\right)$.