1. Solve $\frac{d^{2}y}{dx^{2}}+\frac{m^{2}}{y^{2}}=0$
2. Solve $ \left(1-x^{2}\right)\frac{d^{2}y}{dx^{2}}+x\frac{dy}{dx}-y=x(1-x^{2})$ , given that $y=x$ is a solution of corresponding homogeneous equation.
3. Solve$\frac{dy}{dx}+\frac{x}{1-x^{2}}y=x\sqrt{y}$
4. *Show that the equation* $(x^{3}-3x^{2}y+2xy^{2}+y^{3})dx-(x^{3}-2x^{2}y+y^{3})dy=0 $$is $*exact and find the solution if y=1 when x=1.*
5. *Show that the differential equation* $(x^{3}+xy^{4})dx+2y^{3}dy=0$ *is not exact ,then solve it.*
6. Solve $x^{4}\frac{d^{4}y}{dx^{4}}+6x^{3}\frac{d^{3}y}{dx^{3}}+4x^{2}\frac{d^{2}y}{dx^{2}}-2x\frac{dy}{dx}-4y=x^{2}+2\cos(\left(lnx\right))$
7. Solve $\frac{d^{2}y}{dx^{2}}+2\frac{dy}{dx}+y=e^{-x}lnx$ by method of variation of parameter.
8. Solve $\frac{d^{2}y}{dx^{2}}+4y=x^{2}\sin(\left(2x\right)).$
9. Solve $x=py-p^{2} $.