Q.1) Fill in the blanks

1) nth derivative of $\frac{1}{x^3+6x^2+11x+6}$ =.....

2) If $v = (x^2 - y^2)f(xy)$ then $v_{xx} + v_{yy}$ =.....

3) If $x = rcos\theta\ y = rsin\theta$ then $(\frac{\partial y}{\partial r})_x$=.....

4) If $x = \tan(logy)$ then the relationship between y_1 & y .....

Q.2) Solve

1) If $u = sin^{-1}(\frac{x+y}{\sqrt{x}+\sqrt{y}})$ then $2x\frac{\partial u}{\partial x} + 2y\frac{\partial u}{\partial y}$ = ?

2) If $y = e^{tan^{-1}(x)}$ then PT $(x^2+1)y_{n+2} + (2(n+1)x - 1)y_{n+1} + n(n+1)y_n = 0$

3) nth derivative of $e^x(2x+3)^3$=?