NAME FATAI-OX AKODESI ASSIGNMENT

DEPT : PETROLEUM ENGG

MATRIC NO : 15/ENG07/021

1. $y = e^{x^2+x}$

$v = 1 \quad v' = 0$

$u = e^{x^2+x} \qquad u^n = (2x+1)^n e^{x^2+x}$

$y = u^n . v^0$

$y^n = (2x+1)^n e^{x^2+x}$

$y' = (2x+1)' e^{x^2+x}$

$v = 2x+1 \quad v' = 2 \quad v'' = 0$ (From y')

$u^n = (2x+1)^n e^{x^2+x}$

$y'' = u^n . v^2 + n u^{(n-1)} v' + 0$

$= (2x+1)' e^{x^2+x} . 2x+1 + n (2x+1)^{1-1} e^{x^2+2} + 0$

$= (2x+1)' e^{x^2+x} (2x+1) + 1 (2x+1)^0 e^{x^2+x} . 2$

Recall $(2x+1)' e^{x^2+x} = y'$

$e^{x^2+x} = y$

$y'' = y'(2x+1) + 2y$

Prove that $y^{(n+2)} = (2x+1) y^{(n+1)} + 2(n+1) y^n$

where $w = y''$

$y'' - y'(2x+1) - 2y = 0$

$v = 1 \qquad v' = 0$

$u = y'' \qquad u^n = y^{(n+2)}$

$w^n = u^n v + 0$

$w^n = y^{(n+2)} . 1$

$w^n = y^{(n+2)}$

where $w^n = (2x+1) y$

$v = 2x+1 \qquad v' = 2 \qquad v'' = 0$

$u = y' \qquad u^n = y^{(n+1)}$

$w^n = u^n v^0 + n u^{(n-1)} v'$

$w^n = {}^{(n+1)} ($