## Assignment 3

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x(x-1) y"}+3(x-1)\mp@subsup{y}{}{\prime}+y=
    =(\mp@subsup{x}{}{2}-x)\mp@subsup{y}{}{\prime\prime}+(3x-1) y'+y=0
An}=\mp@subsup{y}{}{n+2}(\mp@subsup{x}{}{2}-x)+n\mp@subsup{y}{}{n+1}(2x)+\frac{n(n-1)}{21}\mp@subsup{y}{}{n}(2
Bn}=\mp@subsup{y}{}{n+1}(3x-1)+n\mp@subsup{y}{}{n}(2
Cn}=\mp@subsup{C}{}{\prime
    = y y+2}(\mp@subsup{x}{}{2}-x)+n\mp@subsup{y}{}{n+1}(2x)+n(n-1)\mp@subsup{y}{}{n}+\mp@subsup{y}{}{n+1}(3x-1)+\mp@subsup{y}{}{n+}\mp@subsup{y}{}{n
    yn+2}(\mp@subsup{x}{}{2}-x)+\mp@subsup{y}{}{n+1}(2x-1)n+(3x-1)+\mp@subsup{y}{}{n}(\mp@subsup{n}{}{2}-n+3n+1)=
    y}\mp@subsup{y}{}{n+2}(\mp@subsup{x}{}{2}-x)+\mp@subsup{y}{}{n+1}(2x-1)n+3x-1)+\mp@subsup{y}{}{2}(\mp@subsup{n}{}{2}+2n+1
        gt }x=
    yn+1}(-n-1)+\mp@subsup{y}{}{n}(\mp@subsup{n}{}{2}+2n+1
    yn+1}=\frac{-\mp@subsup{y}{}{n}(\mp@subsup{n}{}{2}+2n+1)}{-n-1
    y y+1}=\frac{f\mp@subsup{y}{}{n}(\mp@subsup{n}{}{2}+2n+1)}{t(1+n)}=\mp@subsup{y}{}{n}(n+1)(n+
                A(1+n) (1+n)
                yn+1}=\mp@subsup{y}{}{n}(n+1
    at n}=
    at n=1
    \mp@subsup{y}{}{\prime\prime}=\mp@subsup{Y}{}{\prime}(2)=2(\mp@subsup{y}{}{0})=2y1
    at n=2
    y'\prime\prime}=\mp@subsup{y}{}{\prime\prime\prime}(3)=3(2\mp@subsup{y}{}{0})=6\mp@subsup{y}{}{\prime
    at n=3
    y+= y'\prime\prime}(4)=4(6\mp@subsup{y}{}{0})=24y
    at n}=
    y5}=\mp@subsup{y}{}{5}(5)=5(24\mp@subsup{y}{}{\circ})=120y
    at n=5
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at \(\begin{aligned} n & =6 \\ y^{6} & =y^{6}(7)=7\left(720 y^{0}\right)=5040 y\end{aligned}\)
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at $n=7$
$y^{7}=y^{7}(8)=8\left(5040 y^{0}\right)=40320 y^{1}$
$=y_{0}+x\left(y^{\prime}\right) 0+\frac{x^{2}}{21}\left(y^{\prime \prime}\right)_{0}+\frac{x^{3}}{31}\left(y^{\prime \prime \prime}\right)+\cdots$
$=y_{0}+x\left(y^{\prime}\right)+\frac{x^{2}}{2!}\left(2 y^{\prime}\right) 0+\frac{x^{3}}{3!}\left(6 y^{\prime}\right)+\frac{x^{4}}{4!}\left(24 y^{\prime}\right)+\frac{x^{5}}{5!}\left(120 y^{\prime}\right)$
$+\frac{x^{6}}{6!}\left(720 y^{1}\right)^{2!}+\frac{x^{7}}{7!}\left(5040 y^{1}\right)$
$=y_{0}+x\left(y^{\prime}\right)+x^{2}\left(y^{\prime}\right)_{0}+x^{3}\left(-y^{\prime}\right):+x^{4}\left(y^{\prime}\right)_{0}+x^{5}\left(y^{\prime}\right)_{0} d=$
$+x^{6}\left(y^{1}\right)_{0}+x^{7}\left(y^{1}\right)_{0}$
$y=\left(y_{0}\right)+y^{\prime}(f x)$
$\begin{aligned} y & =0.005 \\ \text { at } x & =5,8,10\end{aligned}$
it $x=5$
$y=0.005+0.0005\left[5^{2}+5^{3}+5^{4}+5^{5}+5^{6}+5^{7}\right]$ $=0.0005+0.0005(113125)$
at $x=8$
$y=0.0005+0.0005\left[8^{0}+8^{2}+8^{3}+8^{4}+8^{5}+8^{6}+8^{7}\right]$
$y=\quad 1198.373$
$y=61198.373$

$$
\begin{aligned}
\text { at } x & =10 \\
y & =0.0005+0.0005\left[10+10^{2}+10^{3}+10^{4}+10^{5}+10^{6}+10^{7}\right] \\
y & =0.005+5555.555 \\
y & =5555.555
\end{aligned}
$$

$$
\begin{aligned}
& \text { Syms } x \\
& \text { Syms } y \\
& x=(0: 10) ; \\
& \left.y=0 \cdot 005+0 \cdot 0005+\left(x+x \cdot \wedge_{2}\right)+(x \cdot \wedge 3)+x \cdot \wedge 4\right) \\
& +(x \cdot \wedge 5)+(x \cdot \wedge 6)+(x \cdot \wedge 7) \\
& \text { Plot }(x, y) \\
& \text { (anid on } \\
& \text { Cnid minar }
\end{aligned}
$$



