

Experiment 9

>> **MATLAB Code**

```
syms x y(x)
yc=dsolve(diff(y,x,2)+4*y==0)
y1=cos(2*x);
y2=sin(2*x);
dy1=diff(y1,x);
dy2=diff(y2,x);
%Solving for Wronskian
w=[cos(2*x) sin(2*x); dy1 dy2]
r=det(w)
w1=[0 sin(2*x); sec(x) dy2]
r1=det(w1)
w2=[cos(2*x) 0; dy1 sec(x)]
r2=det(w2)
%Using Wronskian for the solution
u=int(r1/r)
v=int(r2/r)
yp=u*cos(2*x)+v*sin(2*x)
y=yc+yp
```

>> **Command Window**

Experiment_9

yc =

$C1 \cos(2x) - C2 \sin(2x)$

w =

$$\begin{bmatrix} \cos(2x) & \sin(2x) \\ -2\sin(2x) & 2\cos(2x) \end{bmatrix}$$

r =

$2\cos^2(2x) + 2\sin^2(2x)$

w1 =

$$\begin{bmatrix} 0 & \sin(2x) \\ 1/\cos(x) & 2\cos(2x) \end{bmatrix}$$

r1 =

$-\sin(2x)/\cos(x)$

w2 =

```
[ cos(2*x), 0]
[ -2*sin(2*x), 1/cos(x)]
```

r2 =

$\cos(2x)/\cos(x)$

u =

$\cos(x)$

v =

$\sin(x) - \operatorname{atanh}(\sin(x))/2$

yp =

$\cos(2x)*\cos(x) - \sin(2x)*(\operatorname{atanh}(\sin(x))/2 - \sin(x))$

y =

$\cos(2x)*\cos(x) + C1*\cos(2x) - C2*\sin(2x) - \sin(2x)*(\operatorname{atanh}(\sin(x))/2 - \sin(x))$