### **Example 3.11 Spherical Catalyst Pellet**

> restart:

> with(plots):

> eq:=diff(c(x),x$2)+2/x\*diff(c(x),x)-phi^2\*c(x);



> BCs:=D(c)(0)=0,c(1)=1;



> sol:=dsolve({eq,BCs},c(x));



Maple is not able to solve this problem directly. We can solve this problem without specifying the boundary conditions:

> sol:=dsolve({eq},c(x));



The solution obtained can be assigned as:

> Ca:=rhs(sol[1]);



Now if ya has to be finite at x = 0, \_C2 should be zero.

> \_C2:=0;



> Ca:=eval(Ca);



Next, the boundary condition at x = 1 is used to solve for \_C1.

> bc2:=subs(x=1,Ca)-1;



> \_C1:=solve(bc2,\_C1);

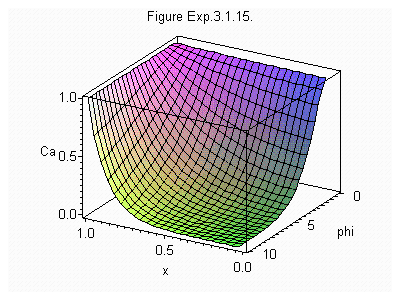


> Ca:=eval(Ca);



A three dimensional plot can be made as:

> plot3d(Ca,x=0..1,phi=0..10,axes=boxed,orientation=[120,60],title="Figure Exp.3.1.15.",labels=[x,phi,"Ca"]);



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