Advanced Engineering Mathematics, by Erwin Kreyszig 10th. Ed.

**Problem Set 2.7**

No. 1



The corresponding homogeneous equation 

Auxiliary equation    



In the nonhomogeneous equation 

Set 

 

Substitute  into the nonhomogeneous equation 



 





General sol. 

No. 2



The corresponding homogeneous equation 

Auxiliary equation    



In the nonhomogeneous equation 

Set 





Substitute  into the nonhomogeneous equation 





Equalize the coefficients ahead and 





 

 



General sol. 

No. 3



The corresponding homogeneous equation 

Auxiliary equation    



In the nonhomogeneous equation 

Set 





Substitute  into the nonhomogeneous equation 







 

 



General sol. 

No. 4



The corresponding homogeneous equation 

Auxiliary equation   





In the nonhomogeneous equation 

Set





Substitute  into the nonhomogeneous equation 



 

 



General sol. 

No. 5



The corresponding homogeneous equation 

Auxiliary equation  

 



In the nonhomogeneous equation 

We set 











Substitute  into the nonhomogeneous equation













General sol. 

No. 6



The corresponding homogeneous equation 

Auxiliary equation 







In the nonhomogeneous equation  is the same as 

Set 





 









Substitute  into the nonhomogeneous equation 















Equalize each term on both sides.

 



General sol. 

No. 7



The corresponding homogeneous equation 

Auxiliary equation  







In the nonhomogeneous equation 

Since is the same as, we modifyas 





Substitute  into the nonhomogeneous equation









Equalize each term on both sides.









General sol. 

No. 8



The corresponding homogeneous equation 

Auxiliary equation  

 



In the nonhomogeneous equation 

Since  term is the same as.

Modifyas 



 

Substitute  into the nonhomogeneous equation











Equalize each term on both sides.











General sol. 

No. 9



The corresponding homogeneous equation 

Auxiliary equation 







In the nonhomogeneous equation 

Since term is the same as, we modifyas 







Substitute  into the nonhomogeneous equation









Equalize the coefficients of and  terms on both sides.





  
General sol. 

No. 10



The corresponding homogeneous equation 

Auxiliary equation  

 (double root)





In the nonhomogeneous equation 

Set













Substitute  into the nonhomogeneous equation











Equalize each term on both sides.













General sol. 

No. 11



The corresponding homogeneous equation 

Auxiliary equation  





In the nonhomogeneous equation 

Set 

 

Substitute  into the nonhomogeneous equation







Equalize the coefficients ahead terms on both sides.









General sol. 



Substitute the initial values,  into the above equations of general solution and its derivative.





 are obtained.

Particular solution 

No. 12



The corresponding homogeneous equation 

Auxiliary equation  

 



In the nonhomogeneous equation 

The term  is the same as , we modify 







Substitute  into the nonhomogeneous equation









Equalize each term on both sides.







General sol. 



Substitute the initial values,  into the above equations of general solution and its derivative.





 are obtained.

Particular solution 

No. 13



The corresponding homogeneous equation 

Auxiliary equation  







In the nonhomogeneous equation 

We set 





Substitute  into the nonhomogeneous equation







Equalize each term on both sides.







General sol. 



Substitute the initial values,  into the above equations of general solution and its derivative.





 are obtained.

Particular solution 

No. 14



The corresponding homogeneous equation 

Auxiliary equation  

 (double root) 



In the nonhomogeneous equation 

We set 





 



Substitute  into the nonhomogeneous equation







Equalize each term on both sides.







General sol. 





Substitute the initial values,  into the above equations of general solution and its derivative.







 are obtained.

Particular solution 

No. 15



The corresponding homogeneous equation 

Auxiliary equation  

  



General sol. 



Substitute the initial values,  into the above equations of general solution and its derivative.





 are obtained.

Particular solution 

No. 16



The corresponding homogeneous equation 

Auxiliary equation  

 



In the nonhomogeneous equation 

We set 



Substitute  into the nonhomogeneous equation









Equalize each term on both sides.







General sol. 



Substitute the initial values,  into the above equations of general solution and its derivative.





 are obtained.

Particular solution 

No. 17



The corresponding homogeneous equation 

Auxiliary equation 









In the nonhomogeneous equation 

We set 





Substitute  into the nonhomogeneous equation











General sol. 





Substitute the initial values,  into the above equations of general solution and its derivative.









Particular solution 

No. 18



The corresponding homogeneous equation 

Auxiliary equation 









In the nonhomogeneous equation 

We set 





Substitute  into the nonhomogeneous equation





 Equalize each term on both sides.













General sol. 



Substitute the initial values,  into the above equations of general solution and its derivative.









And 

Particular solution 

No. 19

問答題，不解

No. 20

問答題，不解