**Problem Set 2.10**

No. 1



Find the general solution of homogeneous equation 

Auxiliary equation 

 















General sol. 

In fact it may be combined as 

另解：method of undetermined coefficients

Set yp as 











Substitute, and into the equation,







Equalize the coeffifients on both sides







General sol. 

No. 2



Find the general solution of homogeneous equation 

Auxiliary equation 

 











General sol. 

No. 3



Find the general solution of homogeneous equation  (Euler-Cauchy)

Auxiliary equation 





 











General sol. 

No. 4



Find the general solution of homogeneous equation 

Auxiliary equation 



 













General sol. 

No. 5



Find the general solution of homogeneous equation 

Auxiliary equation 

 























General sol. 

may be expressed as 



No. 6



Find the general solution of homogeneous equation 

Auxiliary equation  

 (double root)

 











General sol. 

No. 7



Find the general solution of homogeneous equation 

Auxiliary equation  

 (double root)

 











General sol. 

No. 8



Find the general solution of homogeneous equation 

Auxiliary equation 

  





























General sol. 

No. 9



Find the general solution of homogeneous equation 

Auxiliary equation  

 (double root)

 

In the nonhomogeneous equation, 











General sol. 

No. 10



Find the general solution of homogeneous equation 

Auxiliary equation  



 

In the nonhomogeneous equation, 







 or 









Or





General sol. 

Or 

No. 11



Find the general solution of homogeneous equation 

(Euler-Cauchy equation)

Auxiliary equation  

 

 

In the nonhomogeneous equation, 





General sol. 

No. 12



Find the general solution of homogeneous equation 

Auxiliary equation  

 

In the nonhomogeneous equation, 





Set   









Set   









General sol.



No. 13



Find the general solution of homogeneous equation 

(Euler-Cauchy equation)

Auxiliary equation  



 

In the nonhomogeneous equation, 





General sol. 

No. 14

(a) 

Find the general solution of homogeneous equation 

Auxiliary equation  



 

In the nonhomogeneous equation, 

(i)undetermined coefficient method

Set

 

Substitute,andinto the equation.















(i)Variation of parameters















General sol. 

Method of undetermined coefficient is simpler.

(b) 

Find the general solution of homogeneous equation 

Auxiliary equation  

 (double root)

 

In the nonhomogeneous equation, 

(i)Variation of parameters for









(i)undetermined coefficient method for 

Set

 

Substitute,andinto the equation.













General sol. 