

Use the method of variation of parameter to solve the following differential equations.

1. $y'' + 2y' + 1 = e^x$

2. $y'' + 5y' - 6y = x \sin(3x)$

3. $y'' + 4y = \frac{2}{\cos(2x)}$

4. $y'' = x^3$

5. $y'' + y' = \ln|x|$

6. $y'' + y = \sec^3 x$

7. $y'' - 2y' + y = \frac{e^x}{1+x^2}$

8. $y'' + 3y' - 2 = \sin x + x \cos x$

9. $y'' - y' = \cos x + 1$

10. $y'' + 5y' - 1 = xe^{3x}$