ODE

Second Order ODE

One Root

1. $0.25y'' - 2y' + 4y = 0$

2. $16y'' - 8y' + y = 0,\ y(0) = 40$

3. $y'' = 0$

4. $9\dfrac{d^2y}{dx^2} - 6\dfrac{dy}{dx} + y = 0$

5. $y'' + 2y' + y = 0$

6. $y'' + 14y' + 49y = 0$

7. $100y'' + 60y' + 9y = 0$

8. $100y'' + 60y' + 9y = 0,\ y(1) = 8$

9. $y'' - 6y' + 9y = 0$

10. $4y'' + 12y' + 9y = 0$

Answers

ODE

Second Order ODE

One Root

1. $y = c_1 e^{4t} + c_2 t e^{4t}$

2. $y = 40 e^{\frac{t}{4}} + c_2 e^{\frac{t}{4}} t$

3. $y = c_1 t + c_2$

4. $y = c_1 e^{\frac{x}{3}} + c_2 e^{\frac{x}{3}} x$

5. $y = c_1 e^{-t} + c_2 t e^{-t}$

6. $y = c_1 e^{-7t} + c_2 t e^{-7t}$

7. $y = c_1 e^{-\frac{3t}{10}} + c_2 e^{-\frac{3t}{10}} t$

8. $y = \left(8 e^{\frac{3}{10}} - c_2 \right) e^{-\frac{3t}{10}} + c_2 e^{-\frac{3t}{10}} t$

9. $y = c_1 e^{3t} + c_2 t e^{3t}$

10. $y = c_1 e^{-\frac{3t}{2}} + c_2 e^{-\frac{3t}{2}} t$