

Math 242 - 005

Professor Silva

Differential Equations Group

Solve the differential equations

1. Solve the differential equation $y' = \frac{(x-1)y^5}{x^2(2y^3-y)}$ (Brad)
2. Solve the differential equation $y' = 1 + x + y + xy$ (Brad)
3. Solve the differential equation $y' = \frac{y}{\tan(x)}$ (Brad)
4. $xy' + y = y^2 \ln x$ (John)
5. $2y' + 8xy = y^4(1 + 4x)$ (John)
6. Solve the IVP: $3y' + 6y^2 = 18y^2 + 4x^3 \cos x + 6x^5 - \sqrt{4(2y)^2}$, $y(0) = 0$, $y'(0) = 0$ (John)
7. $(e^x + ye^{xy}) + (e^y + xe^{xy})y' = 0$ (Kadee O'Donoghue)
8. $(x + \tan^{-1}y) dx + (\frac{x+y}{1+y^2}) dy = 0$ (Kadee O'Donoghue)
9. $(e^x \sin y + \tan y) dx + (e^x \cos y + x \sec^2 y) dy = 0$ (Kadee O'Donoghue)
10. $(\frac{2x}{y} - \frac{3y^2}{x^4}) dx + (\frac{2y}{x^3} - \frac{x^2}{y^2} - \frac{1}{\sqrt{y}}) dy = 0$ (Kadee O'Donoghue)
11. Find the general solution: $y'' = -x(y')^2$ (Beth Mersha)
12. Find the general solution: $yy'' + (y')^2 = 0$ (Beth Mersha)
13. Find the general solution: $y'' = -x(y')^2$ (Beth Mersha)
14. Find the general solution: $yy'' + (y')^2 = yy'$ (Beth Mersha)
15. Find the general solution: $y'' = (x + y')^2$ (Beth Mersha)

1. Determine the inverse Laplace transform of the following equation: $F(s) = (\frac{4s}{4s^2+1})$ (Jami)
2. Solve the IVP using Laplace transform: $x'' + 6x' + 18x = \cos(2t)$, $x(0) = 1$, $x'(0) = -1$ (Jami)
3. Determine the Laplace transform of the following equation: $f(x) = x^4 e^{\pi x}$ (Jami)

Solve the Differential Equations

1. $y'' + 2y' - 3y = 0$ (Carly)
2. $y'' - 2y' + 5y = 4 \sin 2x$ (Carly)
3. $y'' + 2y' - 8y = 3 + x$ (Carly)

1. Solve the differential equation of the following :

- a) $X (dy/dx) = \sqrt{x^2 - y^2} + y$? (Fahad)
- b) $2x^2 y - x^3 (dy/dx) = y^3$ (Fahad)

Who Did What -

Brad Smolen - Separable

Beth Mersha - Reducible

Kadee O'Donohue - Exact Differential

John Joven - Formula Base

Fahad - Substitution

Jami Winn - Laplace Transforms

Carly Lawyer - Linear Constant Coefficients

