MATH 4305 - Ordinary Differential Equations II
Homework 0.1 - Separable Equations
Due - Wednesday, August 26, 2015

Solve each differential equations using separation of variables. (Note: Please solve for the dependent variable, whenever possible. For some problems, you will not be able to solve for the independent variable; in these cases, write the solution in implicit form as an equation that equals 0.)

1. $\frac{dy}{dx} = -\frac{x}{y}$ with initial condition $y(3) = 4$. What type of curve is this?

2. $\frac{dy}{dx} = -\frac{x-4}{y+1}$ with initial condition $y(3) = 2$.

3. $\frac{dy}{dx} = xy + 3x + 4y + 12$

4. $\frac{dy}{dx} = \frac{\sin(x)}{\cos(y)}$

5. $\frac{dx}{dt} = x^2t^3$

6. $xdx + \frac{1}{y}dy = 0$

7. $(t^2+1)dt + (y^2+y)dy = 0$

8. $y' = \frac{ye^t}{y+1}$