Differential Equations LaTeX Assignment

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Directions

1. Sign up for one of the problems listed below using Sign Up Genius:

   1. $\dfrac{dy}{dx} = \dfrac{2xy}{1+x^2}$
   2. $\dfrac{dy}{dx} = \dfrac{3}{\sqrt{xy}}$
   3. $\dfrac{dy}{dx} = \dfrac{x^2(y-1)}{y^2(x+1)}$
   4. $\dfrac{dy}{dx} = \dfrac{-\tan y}{(1-x^2)}$
   5. $\dfrac{dy}{dx} = \dfrac{3y}{x(y-2)}$
   6. $\dfrac{dy}{dx} = \dfrac{\cos x}{-2y}$
   7. $\dfrac{dy}{dx} = \dfrac{xy-2y}{y^2+1}$
   8. $\dfrac{dy}{dx} = \dfrac{-xe^{x^2}}{y^3-1}$
   9. $\dfrac{dy}{dx} = \dfrac{3x-1}{(x-3)(x+1)}$
   10. $\dfrac{dy}{dx} = e^{x-y}$
   11. $\dfrac{dy}{dx} = \dfrac{-y}{x^2}$
   12. $\dfrac{dy}{dx} = \dfrac{-x^2}{y}$

2. Find the general solution of your chosen differential equation.

3. Find the particular solution of your differential equation satisfying three different initial conditions. You may choose your own initial conditions. (You may wish to sketch the slope field prior to choosing your initial conditions. Choose points that will fit nicely on your graph.)

4. Sketch the slope field for your differential equation, along with the three solutions found in the previous step.

   (a) Go to Desmos Slope Field Generator to create your slope field.

   (b) Login or register so that you can save/export your graph when finished.

   (c) Click in box number 2 and replace the sample differential equation with your own (i.e., replace $\frac{2x}{y}$ with whatever your $\frac{dy}{dx}$ is equal to).

   (d) Click the folder icon to the left of "Moveable Point" to hide the moveable point.

   (e) Click in the empty space below "Moveable Point" and enter the equation of your particular solution. Note: do not type the equation in LaTeX; just type it as you would in your calculator. For example, `y=e^(-cos x)`.

   (f) Repeat this step to enter your remaining two particular solutions.

   (g) Click on the house icon on the right to adjust the zoom.

   (h) Click the green "Share Graph" icon at the top of the page, then click the button labeled "Image". Your graph should open in a new window. Click on the graph to download the png file.