For the DEs in Problems 9-11, use
the corresponding direction fields to draw some solutions. Try to give the general solutions as formulas.

9. $y' = 2y$

$$\frac{dy}{dt} = 2y$$

$$\frac{1}{y}\frac{dy}{dt} = 2$$

$$\int \frac{1}{y}\frac{dy}{dt}dt = \int 2dt$$

$$ln|y| + c_1 = 2t + c_2$$

$$\text{let } c_3 = c_2 - c_1,\ ln|y| = 2t + c_3$$

$$e^{ln|y|} = e^{2t+c_3}$$

$$|y| = e^{c_3}e^{2t}$$

$$\text{let } C = \pm e^{c_3}, y = Ce^{2t}$$

General Solution to 9: $y = Ce^{2t}, C \in \mathbb{R}$

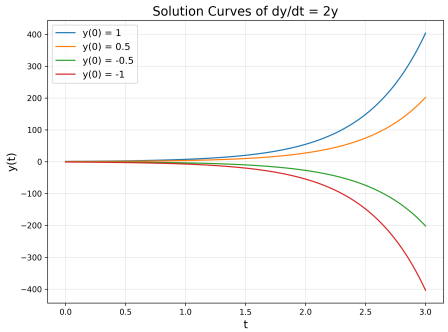
Solution Curves of dy/dt = 2y
y(0) = 1
y(0) = 0.5
y(0) = -0.5
y(0) = -1
y(t)
t
400
300
200
100
0
−100
−200
−300
−400
0.0
0.5
1.0
1.5
2.0
2.5
3.0

Figure 1: