

1. Do WebAssign 11.2. Again, start with the WebAssign.

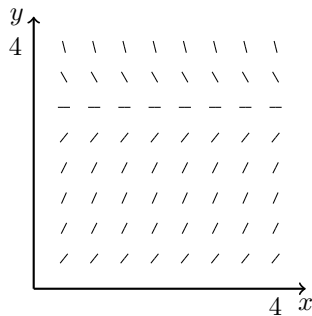
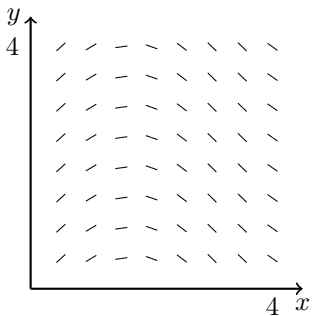
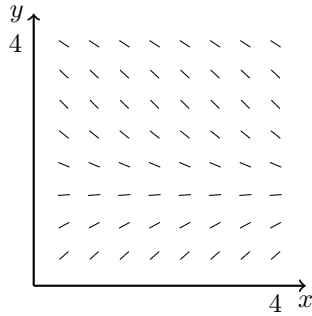
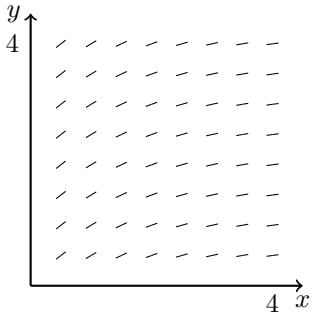
2. Match the following slope fields with the appropriate differential equation

(a)  $y' = y(3 - y)$

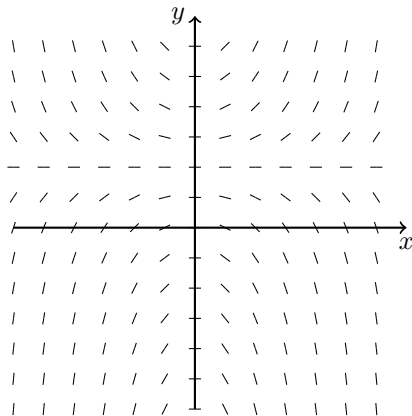
(b)  $y' = \cos(4 - x)$

(c)  $y' = e^{-x/2}$

(d)  $y' = \cos(y)$



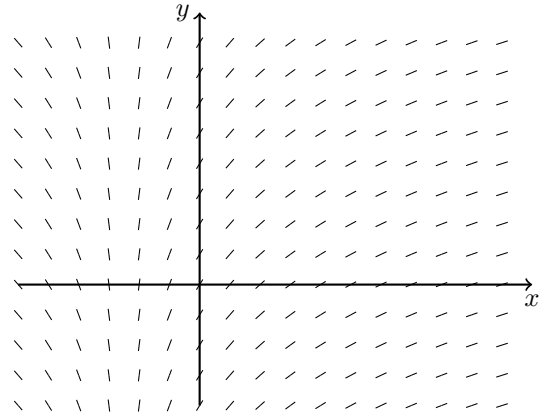
3. The slope field for the equation  $y' = x(y - 1)$  is shown below. Sketch the solutions that pass through the points (a)  $(0, 1)$ , (b)  $(0, -1)$  and (c)  $(0, 0)$ .



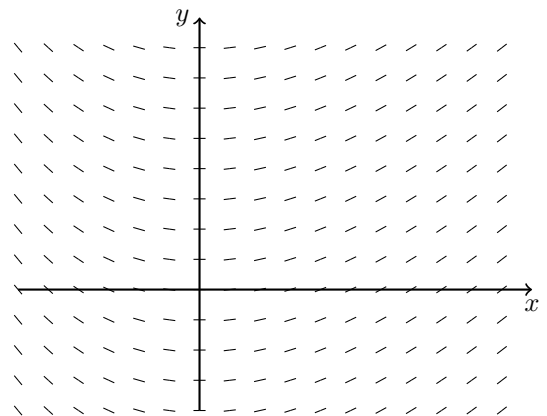
From the graph, write down the solution to the initial value problem with  $y(0) = 1$ .

Check your answer above by substituting it into the differential equation.

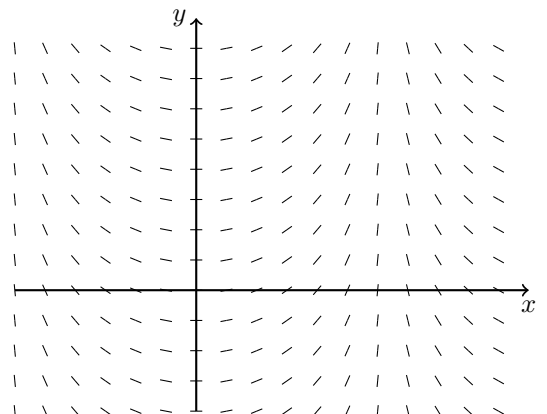
4. Plot three solutions to the differential equation and describe what happens to the solution  $y(0) = 0$ .



5. Plot three solutions to the differential equation and describe what happens to the solution  $y(0) = 0$ .



6. Plot three solutions to the differential equation and describe what happens to the solution  $y(0) = 0$ .



# Separation of Variables

Section 11.4  
November 22, 2016

Name:  
Math 129 - 01

Understand	Identify “separable” differential equations as those that can be written as $y' = f(y)g(x)$ .
Understand	Determine whether or not a differential equation is separable
Apply	Use Separation of variables to analytically find the general solution to a differential equation.
Apply	Use Separation of variables to analytically solve an initial value problem.

1. Integrate both sides (don't forget the constant!)

$$\int p dp = \int 4 + 2s ds$$

Express  $p$  in terms of  $s$  given that  $p = 2$  when  $s = 0$ .

2. Integrate to express  $y$  in terms of  $x$  given that  $y(0) = 1$ .

$$\int \frac{1}{y^2} dy = \int \tan(x) dx$$

3. Integrate to express  $x$  in terms of  $t$  and an arbitrary constant.

$$\int \frac{1}{x \ln(x)} dx = \int \frac{1}{t} dt$$

Hint: You can simplify the algebra by writing your constant of integration as  $\ln(A)$  instead of  $C$ .

Quiz (Leave this space blank)