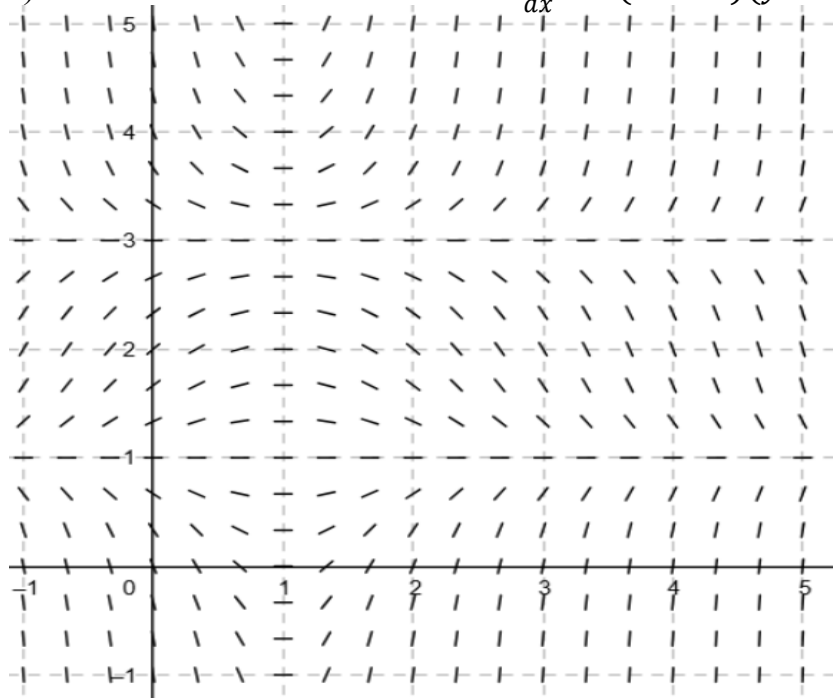


Direction Fields and Euler's Method (Sec 7.3)

1) Below is a direction field for: $\frac{dy}{dx} = (x - 1)(y - 1)(y - 3)$



Sketch solution curves for:

a) $y(0) = 0.7$

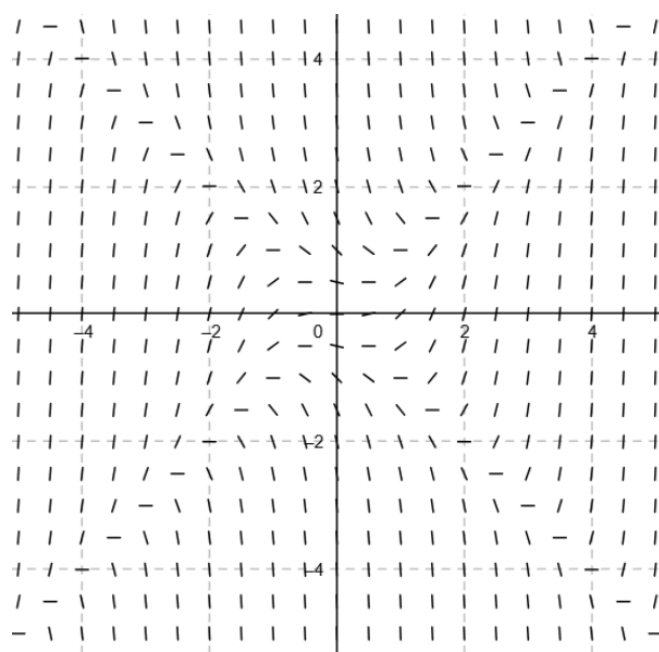
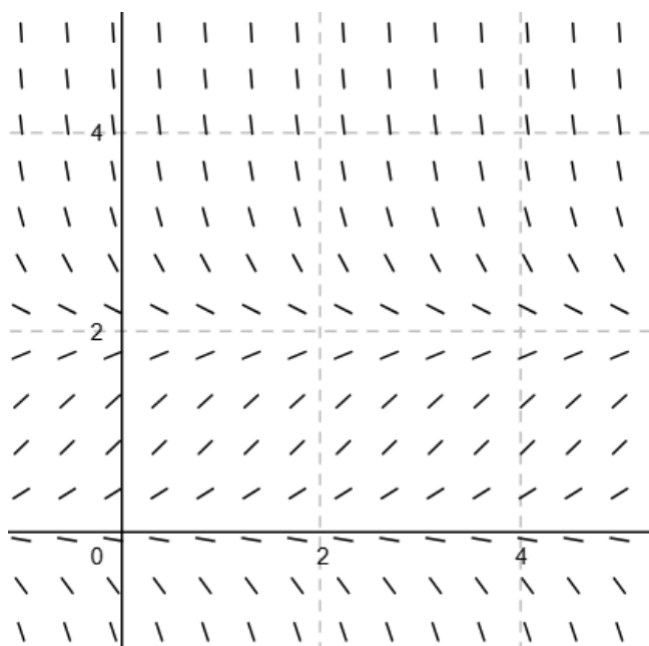
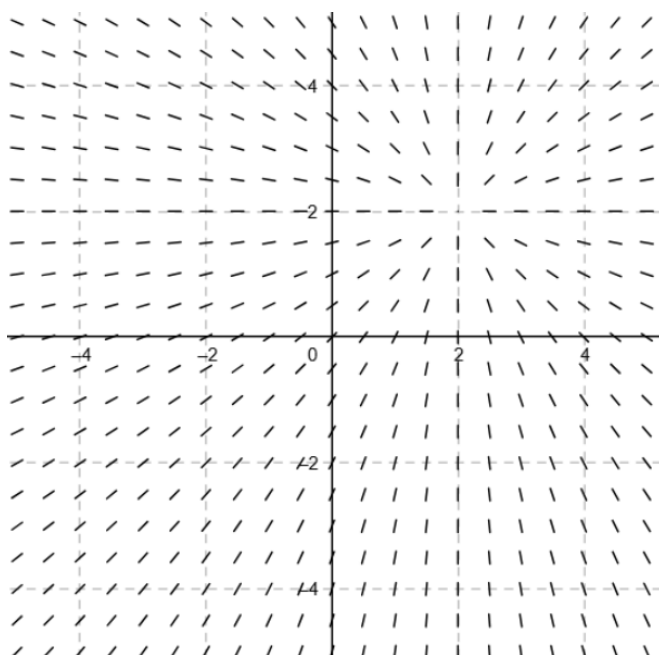
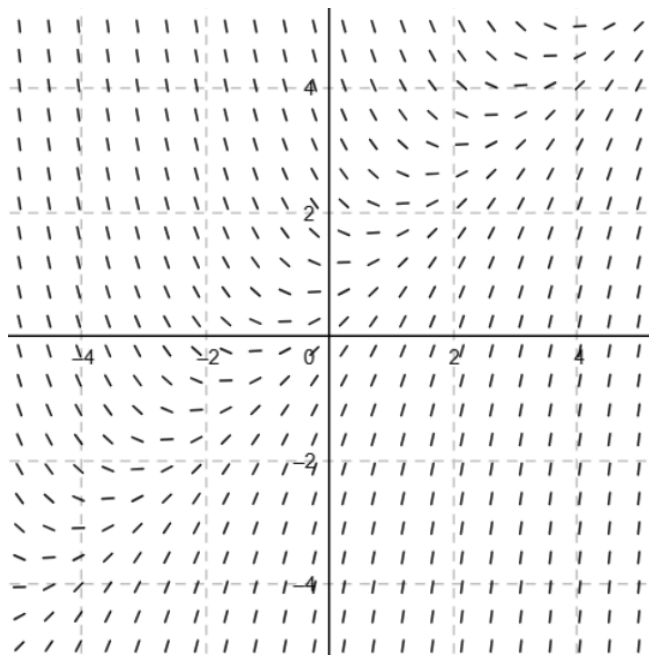
b) $y(0) = 2$

c) $y(0) = 4$

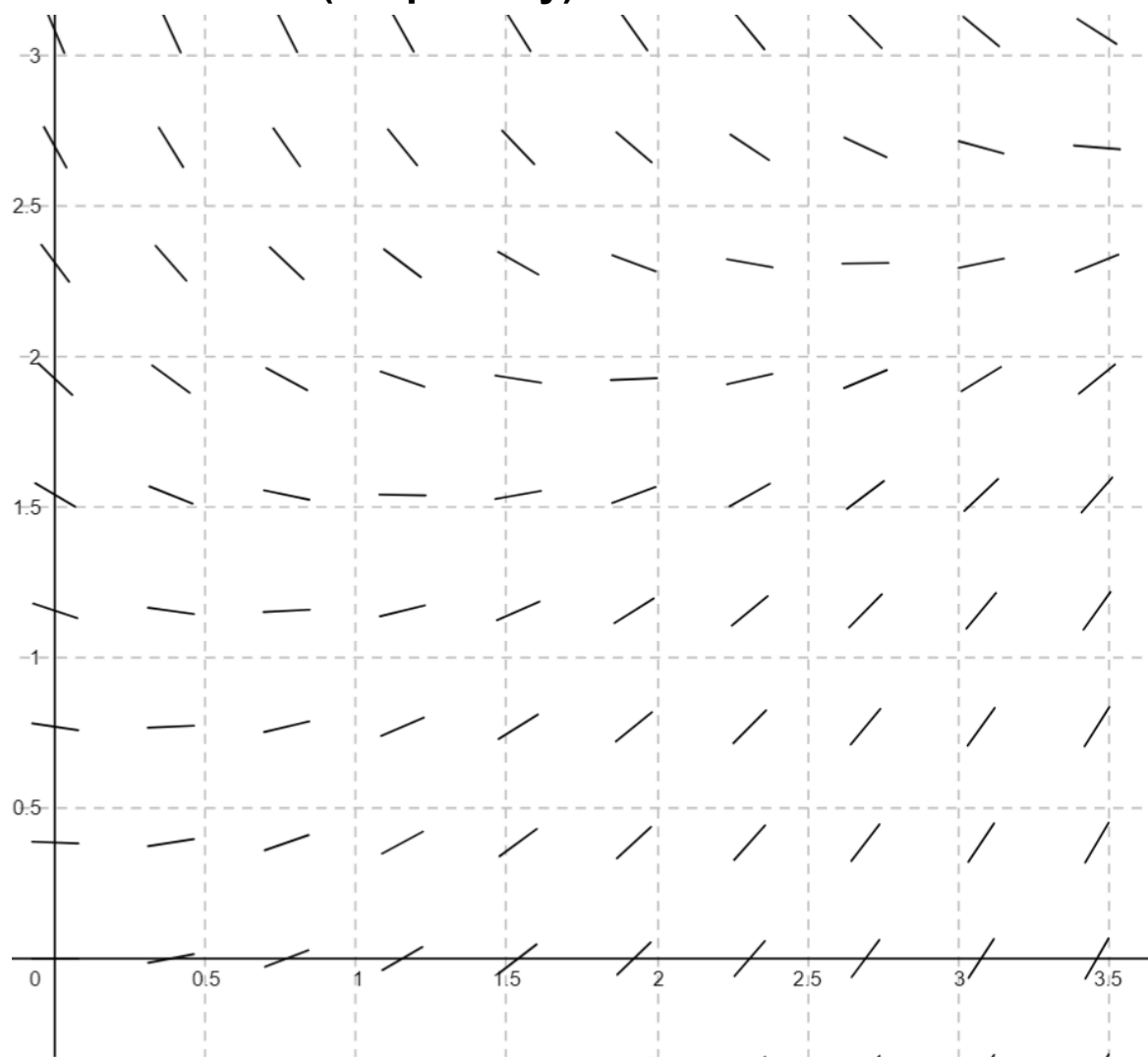
2) Sketch a direction field for $\frac{dy}{dx} = y - x$

3) Match the differential equation with the direction fields below

A. $\frac{dy}{dx} = y(2 - y)$ B. $\frac{dy}{dx} = x^2 - y^2$ C. $\frac{dy}{dx} = x - y + 1$ D. $\frac{dy}{dx} = \frac{y-2}{x-2}$



Euler's Method (Graphically)



1) If $y(0) = 2$ and $h = \frac{1}{2}$, estimate $y(2)$

2) If $y(0) = 2$ and $h = 1$, estimate $y(2)$

3) The direction field is for the DE $y' = \frac{1}{2}x - \frac{1}{2}y$. Use Euler's Method to numerically estimate $y(2)$ using step size $h = \frac{1}{2}$

4) Consider the DE $\frac{dy}{dx} = y + xy$; $y(0) = 1$

a) Solve the DE and find $y(0.5)$.

b) Use Euler's Method with step size 0.1 to estimate $y(0.5)$