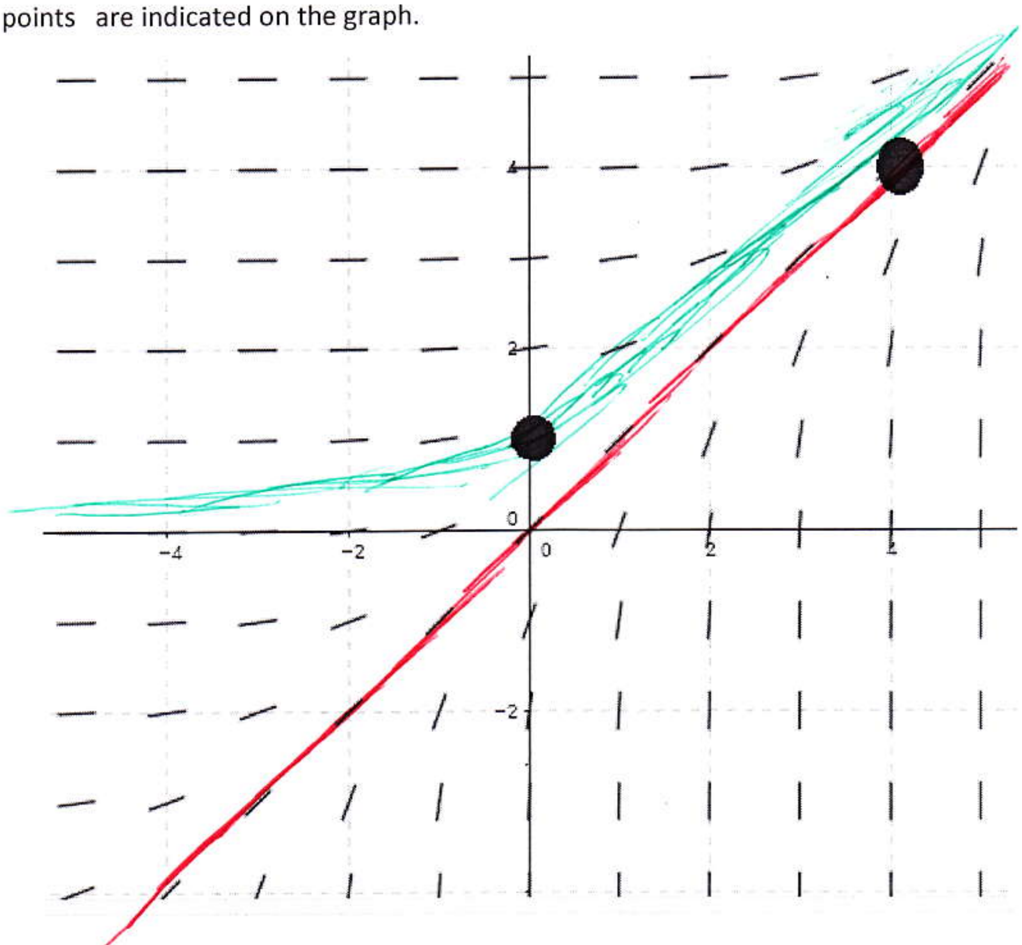
Name Over the weekend 3/17 - 3/18 if needed,

Consider the differential equation $\frac{dy}{dx} = e^{x-y}$

a) The slope field for the given differential is shown below. Sketch the solution curve that passes through the point (4, 4) and sketch the solution curve that passes through the point (0, 1). Both points are indicated on the graph.



b) Write the equation of the line tangent to the solution curve at the point (4, 4)

c) Find the particular solution $y = f(x)$ to the differential equation with the initial condition (0, 1) and state its domain.

(b) $\frac{dy}{dx} = \frac{e^x}{e^y}$

$e^y dy = e^x dx$

$e^y = e^x + C$

$e^4 = e^4 + C$

$0 = C$

$e^y = e^x$

$\boxed{y = x}$

(c)

$$\frac{dy}{dx} = \frac{e^x}{e^y}$$

$e^y dy = e^x dx$

$e^y = e^x + C$ $(0, 1)$

$e = e^0 + C$

$e = 1 + c$

$e - 1 = c$

$e^y = e^x + e - 1$

$y = \ln(e^x + e - 1)$

Domain $e^x + e - 1 > 0$

$e^x > 1 - e$

e^x is always > 0 so

All reals