Sign of $x'$

$x' = 0 \ (x = 0)$

$y' = 0 \ (y = 1 - x)$

Sign of $y'$

$y' = 0 \ (y = 2 - 3x)$

Both nullclines

Critical points at intersections of $x' = 0$ nullcline & $y' = 0$ nullcline

$(0,0)$

$(\frac{1}{3}, \frac{2}{3})$

$(0, \frac{2}{3})$

$(1,0)$

To save time, you can draw the phase portrait on top of the last picture.