Webwork: First order Equation - seperable

$$y' = (2-2x)y^2$$

1st STEP → $\frac{dy}{dx} = 2(1-x)y^2$

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

$\int \frac{dy}{y^2} = \int 2(1-x)\,dx + C$

$-\frac{1}{y} = 2\left(x - \frac{x^2}{2}\right) + C$

$\frac{1}{y} = 2\left(\frac{x^2}{2} - x\right) - C$

$y = \frac{1}{2\left(\frac{x^2}{2} - x\right) - C}$

$y = \frac{1}{(x^2-2x)-C}$ ← General solution

2nd STEP: $y(0) = \frac{1}{-24}$

$\frac{1}{-24} = \frac{1}{(0^2-2(0))-C}$

$\frac{1}{-24} = \frac{1}{-C}$

$24 = C$

$y = \frac{1}{(x^2-2x)-24}$ ← Particular solution

3rd STEP: $x^2 - 2x - 24 = 0$

$(x-6)(x+4)$

$x = 6, -4$

$(-\infty, 6) \cup (6, -4) \cup (-4, \infty)$