求解起始值問題 $\dfrac{dy}{dx} = \dfrac{y}{x^2 - 3x + 2}$; $y(0) = 2$. [101 屏科大機械 1]

[解]原式 $\Rightarrow \dfrac{dy}{y} = \dfrac{dx}{x^2 - 3x + 2} \Rightarrow \dfrac{dy}{y} = \dfrac{dx}{(x-2)(x-1)} \Rightarrow \displaystyle\int \dfrac{dy}{y} = \int \dfrac{dx}{(x-2)(x-1)} + k$

$\displaystyle\int \dfrac{dy}{y} = \int (\dfrac{1}{x-2} - \dfrac{1}{x-1})dx + k \Rightarrow \ln y = \ln(x-2) - \ln(x-1) = k \Rightarrow \ln \dfrac{y(x-1)}{x-2} = k$

$\dfrac{y(x-1)}{x-2} = C$

$y(0) = 2 \Rightarrow \dfrac{2(0-1)}{0-2} = C \Rightarrow C = 1$

解為 $\dfrac{y(x-1)}{x-2} = 1 \Rightarrow y(x-1) = x-2$