

$$\text{ПЗН: } y^2 + x^2 \frac{dy}{dx} = xy \frac{dy}{dx}$$

$$\text{ВН: } y^2 + x^2 y' = xy y' \quad / : xy$$

$$\frac{y}{x} + \frac{x}{y} y' = y'$$

$$\frac{y}{x} = t \quad y' = t'x + t$$

$$x + \frac{1}{t}(t'x + t) = t'x + t$$

$$t'x(\frac{1}{t} - 1) + 1 = 0$$

$$\frac{dt}{dx} x(\frac{1}{t} - 1) + 1 = 0 \quad / : x ; \cdot dx$$

$$(\frac{1}{t} - 1)dt + \frac{dx}{x} = 0$$

$$(\frac{1}{t} - 1)dt = -\frac{dx}{x}$$

$$\int (\frac{1}{t} - 1)dt = -\int \frac{dx}{x}$$

$$\ln|t| - t = -\ln x + \ln C$$

$$\ln|t| - t = \ln(\frac{C}{x})$$

~~$$\ln|\frac{y}{x}| - \frac{y}{x} = \ln(\frac{C}{x})$$~~

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объяснение

$$\ln|\frac{y}{x}| - \frac{y}{x} = \ln(\frac{C}{x})$$