REŠI

$$xy' - y = \sqrt{x^2+y^2}$$

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

(ENAČBA S HOMOGENO DESNO STRANJO)

UVEDEMO NOVO SPREMENLJIVKO

$$u = \frac{y}{x} \Rightarrow y = ux \Rightarrow y' = u'x + u$$

$$u'x + u = u + \sqrt{1+u^2}$$

$$u'x = \sqrt{1+u^2} \quad \Big| : \sqrt{1+u^2} \quad (\sqrt{1+u^2} > 0)$$

$$\frac{du}{\sqrt{1+u^2}} = \frac{dx}{x}$$

$$\int \frac{du}{\sqrt{1+u^2}} = \ln|u+\sqrt{1+u^2}| + C$$

(GLEJ TABELO OSNOVNIH INTEGRALOV)

$$\int \frac{du}{\sqrt{1+u^2}} = \int \frac{dx}{x}$$

$$\ln|u+\sqrt{1+u^2}| = \ln|x| + \ln C \qquad C > 0$$

$$|u+\sqrt{1+u^2}| = C|x|$$

$$u+\sqrt{1+u^2} = Dx \qquad D \in \mathbb{R}\setminus\{0\}$$

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

$$\boxed{y + \sqrt{x^2+y^2} = Dx^2 \ , \ D \neq 0}$$