Matching Game – Separated ODE's

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Instructions: Select a question clicking its checkbox. Solve the problem and find the answer. No guessing! A maximum of 3 tries on any problem before you get 3 penalty points ! Passing is to complete the puzzle with only 4 incorrect answers.

To the picture: He was born on May 10, 1899 in Uherský Ostroh and died on July 22, 1995 in Brno. He was a Czech mathematician best known today for his work in graph theory and in theory of differential equations, namely he established theory of global transformations of second order differential equations.

Who is he? – Solve problems on next page.

Questions

1. $y' = \dfrac{y^2+1}{x^2+1}$

2. $y' = \dfrac{x}{y}$

3. $y' = \dfrac{e^x}{e^y}$

4. $y' = \dfrac{y}{y^2+1}x$

5. $y' = e^x e^y$

6. $y' = \dfrac{x^2+1}{y^2+1}$

7. $y' = \dfrac{y^2+1}{y}x$

8. $y' = \dfrac{1}{y}$

9. $y' = \cos^2 y \cos x$

Answers

a. $\ln(y^2+1) = x^2 + C$

b. $y^2 = x^2 + C$

c. $\operatorname{tg} y = \sin x + C$

d. $y^2 + y = x^2 + C$

e. $\operatorname{arctg} y = \operatorname{arctg} x + C$

f. $y = \ln(C - e^x)$

g. $y = \ln(e^x + C)$

h. $y = -\ln(C - e^x)$

i. $y^2 = 2x + C$

j. $y^3 + 3y = 3\operatorname{arctg} x + C$

k. $y^3 + 3y = x^3 + 3x + C$

l. $y^2 + \ln(y^2) = x^2 + C$