Answer on Question #79196 – Math – Differential Equations

Question

Solve the differential equation
$$y' = x(1 + y^2)$$

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

Solution

$$y' = x(1 + y^{2})$$
$$\frac{dy}{dx} = x(1 + y^{2})$$
$$\frac{dy}{1 + y^{2}} = xdx$$
$$\int \frac{1}{1 + y^{2}} dy = \int x dx$$
$$\arctan y = \frac{x^{2}}{2} + c$$
$$y = \tan\left(\frac{x^{2}}{2} + c\right)$$
tion is correct, $y = \tan\left(\frac{x^{2}}{2} + c\right)$.

Answer: the fourth option is correct

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