Round 1	Find dy/dx if $y=\ln\sqrt{x^2+1}$	Find dy/dx if $y=\frac{\sqrt{x+1}(2-x)^5}{(x+3)^7}$	Find dy/dx if $y=x^{\cos x}$
Round 2	$\int\frac{1-3y}{\sqrt{2y-3y^2}}dy$	$\int\frac{2x+1}{2x}dx$	Solve the differential equation $\frac{dy}{dx}=\frac{2x}{x^2+9}$ (0,4)
Round 3	A particle moving along a line with acceleration 2 + 6t at time t. When t = 0, its velocity equals 3 and it is at position s = 2. When t = 1, what is its position?	$\int_1^{e^9}\frac{\sqrt{\ln x}}{x}dx$	$\int_1^4 \lvert x-3\rvert\,dx$
Round 4	$\lim\limits_{x\to 6^-}$ ln(6- x)	$g(x)=\int_1^{\ln x}(t^2+3)dt$. Find g'(x)	$\int\frac{x^3-3x^2+5}{x-3}dx$
Round 5	Find the area of the region bound by the graphs of the equations $y=\frac{x^2+4}{x}$; x = 1, x = 4, y = 0	Solve the differential equation $\frac{dr}{dt}=\frac{\sec^2 t}{\tan t+1}$ (π, 4)	$\int\frac{dx}{x^2+2x+1}$

Answers

Round 1	$\frac{x}{x^2+1}$	$y'=\frac{\sqrt{x+1}(2-x)^5}{(x+3)^7}\left[\frac{1}{2(x+1)}-\frac{5}{2-x}-\frac{7}{x+3}\right]$	$y'=x^{\cos x}\left[-\sin x\ln x+\frac{\cos x}{x}\right]$
Round 2	$\sqrt{2y-3y^2}$	$x+\frac{1}{2}\ln\lvert x\rvert+C$	Ln|x^2 +9| +4 +ln9
Round 3	7	18	5/2
Round 4	-∞	$\frac{(\ln x)^2+3}{x}$	$\frac{x^3}{3}+5\ln\lvert x-3\rvert+C$
Round 5	15/2 + 8ln2	$r=\ln\lvert\tan t+1\rvert+4$	$\frac{1}{x+1}+C$