MATH 202, Fall 2023 **Name:** _____

In class work week 4(a) **Row and Seat**: _____

In class work **4(a)** has questions **1** through **4** with a total of **6** points. Turn in your work at the end of class *on paper*. This assignment is due *Tuesday 12 September 13:20*.

1 1. Show that $3y^2 = 2x^3 + C$ is a GS to the DE $y\dfrac{\mathrm{d}y}{\mathrm{d}x} = x^2$.

1 2. Find a GS to the DE $y\dfrac{\mathrm{d}y}{\mathrm{d}x} = \cos(2x)$.

[1] 3. Find a GS to the DE $\frac{1}{x}\frac{dy}{dx} = \frac{1}{y}$.

4. Look up the derivatives of the inverse hyperbolic functions in the QRS. Use these results to find the following antiderivatives. To find each antiderivative, make a change of variable of the form $x = \alpha z$, where α is a cleverly choosen number.

[1] (a) $\int \frac{1}{\sqrt{25x^2+1}}\,dx$

[1] (b) $\int \frac{1}{\sqrt{x^2-12}}\,dx$

[1] (c) $\int \frac{1}{x^2-81}\,dx$