

Written HW4 – MATH 2502 Fall 2021

**Due by 3 September for timely completion credit**

Recall that the sinh function is defined by  $\sinh(x) = \frac{e^x - e^{-x}}{2}$  and the tanh function is  $\tanh(x) = \frac{e^x - e^{-x}}{e^x + e^{-x}}$ . In the previous WHW3, you found the formula for  $\operatorname{atanh}$  in terms of the logarithm. For this assignment, you may use the following given antiderivative formulas:

$$\int \frac{1}{1+x^2} dx = \arctan(x) + C \quad \int \frac{1}{\sqrt{1-x^2}} dx = \arcsin(x) + C$$
$$\int \frac{1}{1-x^2} dx = \operatorname{atan}(x) + C \quad \int \frac{1}{\sqrt{1+x^2}} dx = \operatorname{asinh}(x) + C$$

Find the following antiderivatives as we did in class. Full credit will be given only if all symbolic details appear. Answers must be in terms of an inverse trigonometric or inverse hyperbolic trigonometric function.

1. Compute  $\int \frac{1}{1+8x^2} dx$ .
2. Compute  $\int \frac{1}{\sqrt{3+x^2}} dx$ .
3. Compute  $\int \frac{1}{x^2-4x+1} dx$ .