

Math 1A Worksheet 31

May 2nd, 2008

1. Let a be a fixed real number. Where is the function

$$g(x) = \int_a^{\sinh x} \cosh^2(t) dt$$

increasing?

2. Let f be a continuous function, and suppose $G(x)$ is an antiderivative for f with $G(2) = 1$. Write $G(x)$ in terms of f , an integral, and a constant.
3. Evaluate the following indefinite integrals:
 - a) $\int x^3(1 - x^4)^5 dx$
 - b) $\int \frac{dx}{5-3x}$
 - c) $\int \frac{1+4x}{\sqrt{1+x+2x^2}} dx$
 - d) $\int \frac{(\ln x)^2}{x} dx$
 - e) $\int e^x \sin(e^x) dx$
 - f) $\int \frac{e^x}{e^x+1} dx$
 - g) $\int \frac{\sin x}{1+\cos^2 x} dx$
 - h) $\int x^5 \sqrt[3]{x^3 + 1} dx$.
4. Find $\int_{-2}^2 (x + 3)\sqrt{4 - x^2} dx$.