Name:
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Math 2B: Quiz 6

(5) **1.** Differentiate the following function. $f(x) = \tan^{-1}(\sec(x))$

$$f'(x) = \frac{\sec(x)\tan(x)}{1+\sec^2(x)}$$

(5) **2.** Integrate $\displaystyle\int \frac{2}{9+x^2}dx$

After factoring out the 9 in the denominator we have

$$\frac{2}{9}\int \frac{1}{1+\frac{x^2}{9}}dx = \frac{2}{9}\int \frac{1}{1+(\frac{x}{3})^2}dx$$

Let $u = \frac{x}{3}$, then $3du = dx$, so substituting we get.

$$\frac{2}{9}\int \frac{3}{1+u^2}du = \frac{2}{3}\int \frac{1}{1+u^2}du = \frac{2}{3}\tan^{-1}(u) + C = \frac{2}{3}\tan^{-1}(\frac{x}{3}) + C$$