

**Quiz 13**

1. (5 points). Evaluate the indefinite integral  $\int \frac{x}{1+x^2} dx$ .

2. (5 points). Evaluate the definite integral  $\int_1^2 t^3 \sqrt{t^2 - 1} dt$ .

3. (5 points). Evaluate the indefinite integral  $\int \frac{\cos 5y}{e^{\sin 5y}} dy$ .

Extra credit. (2 points). Determine the area of the region between  $y = \sin x$  and  $y = \cos x$  on the interval  $[0, \pi/2]$ .

Super extra credit. (5 points). Evaluate  $\int_0^1 \frac{x^4(1-x)^4}{1+x^2} dx$ . Simplify the result to reach a nice conclusion (notice that the integrand is nonnegative).