

Math 142 Practice for Test 1

You must show all of your work and reasoning to receive full credit.

[15] 1. Evaluate the definite integral.

$$\int_0^{\frac{1}{2}} \sin^{-1} x \, dx$$

[15] **2.** Evaluate the definite integral.

$$\int_0^{\frac{\pi}{4}} \tan^3 t \, dt$$

[15] **3.** Evaluate the indefinite integral.

$$\int x^2(9 - x^2)^{-\frac{3}{2}} \, dx$$

[15] **4.** Evaluate the indefinite integral.

$$\int \frac{2x^3 + 2x^2 - 2x + 2}{x^4 - 2x^2 + 1} dx$$

[20] **5.** Evaluate the indefinite integral.

$$\int x^3 \ln (x^2 + 1) \, dx$$

[20] **6.** Find all real values of p such that the integral

$$\int_1^2 \frac{1}{x(\ln x)^p} dx$$

is convergent.