Name: ————————————————————— **Section:** —————

Names of collaborators: ——————————————————————

Main Points:

1. Trig substitution: for some integrands with $x^2 + a^2$, $\sqrt{a^2 - x^2}$, or $\sqrt{x^2 - a^2}$

2. Transform to trig. integral and use the methods of 7.2

When the integrand looks similar to the derivative of an inverse trig function it is sometimes possible to transform the integral to a trig. integral. Then we can use the methods of 7.2 to evaluate the integral.

Exercises

1. Evaluate $\displaystyle\int \frac{dx}{x^2\sqrt{x^2 - 9}}$

2. Evaluate $\displaystyle\int \frac{dx}{x^2\sqrt{25 - x^2}}$

3. Evaluate $\int \sqrt{1 - 4x^2}\, dx$.   Hint: You may want to use the identity $\sin(2\theta) = 2\sin\theta\,\cos\theta$.

4. Evaluate $\int_0^1 \dfrac{dx}{(x^2 + 1)^2}$

5. Briefly explain how you can tell which substitution to make.