

**Homework 9**  
**Calculus II**

**Due March 5, 2026**  
**Prof. Nollet**

Section 8.3 #1, 8, 13, 21, 24, 30, 33, 40, 45.

Hints:

#1. Set  $x = 3 \tan \theta$ . You might need Table 8.1 to do the integral, then draw the triangle to finish.

#8. Set  $t = \frac{1}{3} \sin \theta$ . Use  $\cos^2 \theta = \frac{1+\cos 2\theta}{2}$  to do the integral. To write final answer in terms of  $t$ , helpful to use  $\sin 2\theta = 2 \sin \theta \cos \theta$ .

#13. Pretty easy, set  $x = \sec \theta$ .

#21. Set  $x = 2 \tan \theta$ . Use the trick from Section 8.2 to do the trig integral.

#24. Set  $w = 3 \sin \theta$ . Use trig identity  $\cot^2 \theta = \csc^2 \theta - 1$  to do integral.

#30. Set  $u = \sec \theta$ . The integral is easy if you convert to  $\sin \theta$  and  $\cos \theta$ .

#33. Even though there is no square root, set  $x = \frac{1}{2} \tan \theta$  anyway, then use the double angle formula to solve the integral, it's similar to #8 above.

#40. Set  $u = e^t$ , then set  $u = \tan \theta$ , integral is super easy.

#45. Use book hint and set  $x = u^2$ , then take  $u = 2 \sin \theta$ . This one is also similar to #8.