

HW 8

April 8, 2016

Problem 1. Show that

$$\sec^2 x - \tan^2 x = 1 \quad (1)$$

You may use the fact that $\sin^2 x + \cos^2 x = 1$.

Problem 2. Calculate

$$\int \sec^6 x \, dx \quad (2)$$

Please refer to the lecture notes for other values of $\int \sec^n x \, dx$.

Problem 3. Show that

$$\sin^2 x = \frac{1 - \cos 2x}{2} \quad (3)$$

(4)

You may use the fact that

$$\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta \quad (5)$$

Problem 4. Calculate

$$\int \sec x \tan^2 x \, dx \quad (6)$$

You may use the integral of any functions we have discussed in class. Please refer to the lecture notes for the record.

Problem 5. Calculate

$$\int \sin^4 x \, dx \quad (7)$$

Problem 6. Calculate

$$\int \sin^2 x \cos^2 x \, dx \quad (8)$$

Problem 7. Calculate

$$\int \frac{\sqrt{1-x^2}}{x^2} \, dx \quad (9)$$

Using trigonometric substitution.

The homework is now closed. It is due April 11th.