PROBLEM SET 2: TRIGONOMETRIC INTEGRALS

Note: Most of the problems were taken from the textbook [1].

Problem 1. *Evaluate the following integrals:*

a) $\int (2 - \cos x)^2 \, dx$

b) $\int_0^{\pi/2} \sin^5 x \, dx$

c) $\int \tan^2 x \cos^3 x \, dx$

d) $\int_0^{\pi} \cos^4(2x) \, dx$

e) $\int \cot^5 x \csc^3 x \, dx$

f) $\int \tan^3 x \sec x \, dx$

g) $\int \cot^3 x \, dx$

h) $\int \sin 8x \cos 5x \, dx$

i) $\int \frac{dx}{\cos x - 1}$

j) $\int x \tan^2 x \, dx$

Problem 2. *For every $n, m \in \mathbb{N}$, show that*

$$\int_{-\pi}^{\pi} \sin mx \cos nx \, dx = 0.$$

References

[1] J. Stewart: *Single Variable Calculus* 8th Edition, Cengage Learning, Boston 2015.