

Written HW11 – MATH 2502 Fall 2021

Due by 22 September for timely completion credit

Recall the trigonometric identities

$$\cos^2(x) + \sin^2(x) = 1, \quad (1)$$

$$\cos^2(x) = \frac{1 + \cos(2x)}{2}, \quad \text{and} \quad \sin^2(x) = \frac{1 - \cos(2x)}{2}. \quad (2)$$

Recall that for general integrals of the form

$$\int \sin^m(x) \cos^n(x) dx,$$

if m or n is odd then you use the Pythagorean identity (1) and if both m and n are even, then you use the reduction formulas (2) as-needed. Use these identities in the appropriate way to compute the following integrals. Full credit can only be obtained by working out the full expressions entirely symbolically in your submission.

1. $\int \sin^3(x) \cos^{25}(x) dx$

2. $\int \cos^4(3x) dx$