MATH 202, Fall 2023 **Name:** _____
In class work week 8 **Row and Seat**: _____

In class work **8** has questions **1** through **4** with a total of **15** points. Turn in your work at the end of class *on paper*. This assignment is due *Thursday 21 September 13:20*.

2 1. Find the area of the region $\{(x, y) | 0 \leq y \leq \sin(x)^2 \text{ and } 0 \leq x \leq \pi\}$.

2 2. Find the numerical value of $\int_0^\pi \cos(x)^3 \, \mathrm{d}x$.

2 3. Find the numerical value of $\int_0^\pi \cos(x)^3 \, \mathrm{d}x$.

3 4. Use the identities

$$\sin(x)\cos(y) = \frac{\sin(y+x) - \sin(y-x)}{2},$$
$$\sin(x)\sin(y) = -\frac{\cos(y+x) - \cos(y-x)}{2},$$
$$\cos(x)\cos(y) = \frac{\cos(y+x) + \cos(y-x)}{2}.$$

to find the values of each of the following definite integrals

2 (a) $\int_0^{2\pi} \sin(5x)\cos(x)\,\mathrm{d}x$.

2 (b) $\int_0^{2\pi} \cos(5x)\cos(x)\,\mathrm{d}x$.

2 (c) $\int_0^{2\pi} \cos(5x)^2\,\mathrm{d}x$.