MATH 202 **Name:**_____

In class work 10 **Row:**_____

"Study without desire spoils the memory, and it retains nothing that it takes in."

LEONARDO DA VINCI

For all $a, b, x \in \mathbf{R}$, we have

$$\cos(ax)\cos(bx) = \frac{\cos(bx+ax)}{2} + \frac{\cos(bx-ax)}{2},$$
$$\cos(ax)\sin(bx) = \frac{\sin(bx+ax)}{2} + \frac{\sin(bx-ax)}{2},$$
$$\sin(ax)\sin(bx) = \frac{\cos(bx-ax)}{2} - \frac{\cos(bx+ax)}{2}$$

1. Find the numerical value of the definite integral

1 (a) $\displaystyle\int_0^{\pi/4} \sin(5x)\sin(6x)\,dx$

1 (b) $\displaystyle\int_0^{\pi} \sin(5x)\sin(6x)\,dx$

2. Use the reduction formula

$$\int \tan(x)^n \, \mathrm{d}x = \frac{\tan(x)^{n-1}}{n-1} - \int \tan(x)^{n-2} \, \mathrm{d}x, \quad n \neq 1 \tag{1}$$

to find $\int \tan(28x)^6 \, \mathrm{d}x$

3. Use the reduction formula

$$\int \sec(x)^n \, \mathrm{d}x = \frac{\sec(x)^{n-2}\tan(x)}{n-1} + \frac{n-2}{n-1}\int \sec(x)^{n-2} \, \mathrm{d}x, \quad n \neq 1 \tag{2}$$

along with

$$\int \sec(x) \, \mathrm{d}x = \log(\tan(x) + \sec(x)) \tag{3}$$

to find $\int \sec(28x)^4 \, \mathrm{d}x$