KFUPM, DEPARTMENT OF MATHEMATICS AND STATISTICS

MATH 102-SECTIONS 04, 14 : TEST 3, T 171, NOVEMBER 07, 2017

Name : ....

ID : ....

Exercise 1. Evaluate the volume of the solid generated by revolving the region under the curve $y = \sin^2(x)$ over $[0, \pi]$ around the y-axis.

Exercise 2. Let f be the function defined by $f(x) = x^2 + x - 2$. Find all real numbers a such that $f(a)$ is the average value of f over $[0, 2]$.

Exercise 3. Let f be the function defined by $f(x) = \cos(3x)\sin(5x)$. Find the average value of f over $[0, \pi/2]$.

Exercise 4. Evaluate the following indefinite integral :
$$I = \int \cos^4 x \sin^5 x \ \mathrm{dx}.$$

Exercise 5. Evaluate the following indefinite integral :
$$I = \int \sec x \tan^2 x \ \mathrm{dx}.$$

Exercise 6. Evaluate the following indefinite integral :
$$I = \int \frac{\sin^5 x}{(\cos x)^{3/2}} \ \mathrm{dx}.$$