UNIVERSITY OF MANITOBA

MATH 1700 D01

Assignment 2

This assignment is based on units 3 and 4. SHOW ALL WORK to get full marks. Leave answers as exact answers. For example, leave it as $1/7$ as opposed to 0.142857.

1.
Sketch the region bounded between the curves $y = \sin x$, $y = \sin 2x$, $x = 0$, $x = \pi$. Find the area of this region.

2.
Let R be the region in the first quadrant bounded by the graphs of $x = y^3$ and $x = 4y$. Which is greater, the volume of the solid generated when R is revolved about the x-axis or the y-axis ?

3.
Sketch the region R bounded by the curves $y = 1/\sqrt{x}$, $x = 1$, $x = 4$, and $y = 0$. Set up, but **DO NOT EVALUATE**, integrals that can be used to find the volume of the solid generated if R is revolved about the x-axis

(a) using cylindrical shells,

(b) using disks or washers.

4.
Evaluate.

(a) $\displaystyle\int_0^1 \frac{x^3}{\sqrt{x^2+1}}\,dx$ (hint: use integration by part)

(b) $\displaystyle\int e^{4x}\sin 5x\,dx$ (hint: use integration by part)

(c) $\displaystyle\int \frac{\cos^3 x}{\sqrt{\sin x}}\,dx$

(d) $\displaystyle\int \sin^4 x\cos^2 x\,dx.$