

UNIVERSITY OF MANITOBA

MATH 1700 D01

Assignment 2

This assignment is based on units 3 and 4.

1.

Sketch the region bounded between the curves $y = \sin\left(\frac{\pi x}{2}\right)$ and $y = x^3$. Find the area of this region.

2.

Let R be the region bounded by the graphs of $y = x(2 - x)$ and $y = 0$ between $x = 0$ and $x = 2$. 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 $y = x^2$, $y = 0$ and $x = 1$. 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) $\int x^2 \cos \pi x \, dx$ (hint: use integration by part)

(b) $\int x^3 e^{-x} \, dx$ (hint: use integration by part)

(c) $\int \sin^3 x \cos^2 x \, dx$

(d) $\int \sin^5 x \, dx$.