Math 2565 - Tutorial 4

Application of Integrals

You will work in your groups via the Zoom breakout rooms to answer the following 2 questions. Try to use the collaboration spaces on OneNote, so your progress can be monitored throughout the session and everyone can contribute.

Solutions to the problems will be uploaded directly after the 2nd tutorial session.

1 (Area between two Curves)

(a) Calculate the area of the segment cut from the curve $y = x(3 - x)$ by the line $y = x$.

(b) Calculate the area between the curves $x = 1 - y^2$ by the line $x = y^2 - 1$.

(c) Calculate the area of the segment between the curves $y = \sin x$ and $y = \frac{1}{\sqrt{2}}$ for $0 \leq x \leq \pi$.

2 (Volume)

(a) Find the volume of the solid formed by rotating the region bounded by $y = x$, $y = 0$, $x = 0$, and $x = 4$ about the x-axis.

(b) Find the volume of the solid formed by rotating the region bounded by $y = x^2$ and $y = \sqrt{x}$ about the x-axis using the using the washer method.

(c) Find the volume of the solid formed by rotating the region bounded by $y = x^2$ and $y = \sqrt{x}$ about the x-axis using the using the shell method.