Volumes by disks, washers, shells.

End of Chapter 5.3. Riemann's Sums. Ch. 5.6, 5.9

Use any technique unless specified. Find the volumes of revolution:

1. Region bounded by \( y = \frac{1}{x^2}, \ y = 0, \ x = \frac{1}{2}, \ x = 2 \) rotated about the Y axis.

2. Region bounded by \( y = \frac{1}{x^2}, \ y = 0, \ x = \frac{1}{2}, \ x = 2 \) rotated about the x axis.

3. Region bounded by \( y = \sqrt{x-2}, \ y = 0, \ x = 2, \ x = 6 \) rotated about the Y axis.
   A. by shells  B. by washers

4. Region bounded by \( y = \sqrt{x-2}, \ y = 0, \ x = 2, \ x = 6 \) rotated about the X axis.

5. Region bounded by \( y = \frac{1}{1+x^2}, \ y = 0, \ x = -1, \ x = 1 \) rotated about the Y axis.

6. Region bounded by \( y = \frac{1}{1+x^2}, \ y = 0, \ x = -1, \ x = 1 \) rotated about the X axis.

7. Region bounded by \( y = \sec x, \ y = 2 \) rotated about the X axis.

8. Region bounded by \( y = \cos^{-1} x, \ y = 0, \ x = -1 \) rotated about the X axis.

9. Region bounded by \( y = \ln x, \ y = 0, \ x = 1, \ x = e \) rotated about the X axis.
   A. Disks  B. Shells

10. Region bounded by \( y = \ln x, \ y = 0, \ x = 1, \ x = e \) rotated about the Y axis.

11. Region bounded by \( y = 7 - 2x, \ y = 0, \ x = 0 \) rotated about the Y axis.
   A. Disks  B. Shells
Chapter 5:
1. Problems ### 46, 48, 50 Page 327.

2. Present the following Riemann’s sums as integrals. Evaluate the integrals:

   a) \(\lim_{x\to\max \Delta x \to 0} \sum_{i=1}^{n} \sqrt{4 - (x_i^*)^2} \Delta x_i\) \(a = -2, b = 2\)

   b) \(\lim_{x\to\max \Delta x \to 0} \sum (3x_i^* + 1) \Delta x_i\) \(a = 0, b = 1\)

3. Present the integrals as Riemann sums
   a) \(\int_{1}^{2} 2x \, dx\) \(b) \int_{1}^{2} \ln x \, dx\) \(c) \int_{-\pi/2}^{\pi/2} (1 + \cos x) \, dx\)

4. Problems ### 54 – 60 even Page 358

5. Calculate \(\int_{0}^{6} \sqrt{1 + x^3} \, dx\) with \(n=6\) by Trapezoids, Midpoints, and Simpson’s method.

Attention: This worksheet is not a sample test. This is just a training material that should help you get ready for the test. There could be problems and questions studied by us but not listed in this work. And of course, do not forget to work on Chapter 7.8

Bonus problems like ### 121-129 or 135-141 Page 544 will appear in Exam 2.