

Math 107-Lecture 11

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Announcements

- Today we cover Section 8.1 - Areas and Volumes
- The deadline for passing the Gateway exam is Friday, February 22. The Gateway counts for 7% of the grade.

Clicker question #1

What has been your performance on the Gateway Exam?

- I passed it on paper (Congratulations!)
- I passed it at the Testing Center (Congratulations!)
- I have tried it a few times and I am very close to passing (send me an email so I can look at your individual performance)
- I have tried it, but I am still far away from passing (visit the MRC or the office hours to review your integration skills)
- I have no intention to pass the Gateway exam (recall that the Gateway is 7% of your grade)

Clicker question #2

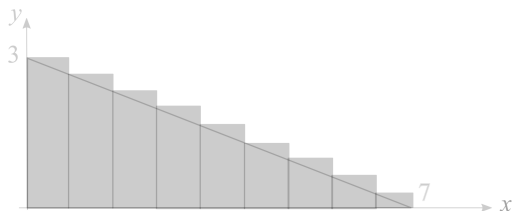
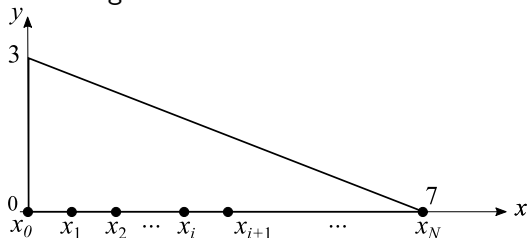
How did the exam go last week?

- ☐ Easy! I think I will get above 90%!
- ☐ It was ok, I solved almost everything
- ☐ A few problems were challenging (or I did finish them), but I had a good performance
- ☐ Not sure about my performance, it may be a low score (below 70 %).
- ☐ It is unlikely that I will get a score above 60 %.

Please email me as soon as possible if you have any concerns about your performance!

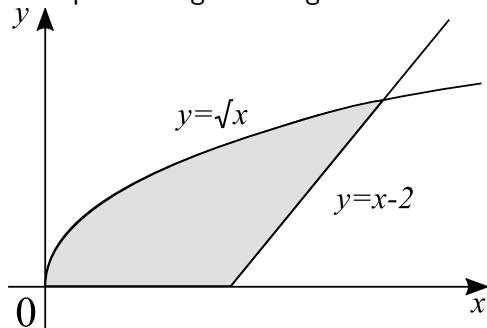
Computing areas: Example 1

Set up an integral that calculates the area of a right triangle whose legs have lengths 3 and 7 in.



Example 2

Set up the integral that gives the area of the shaded figure.



Clicker question #3

At what point(s) do the graphs of

$$y = \sqrt{x}$$

and

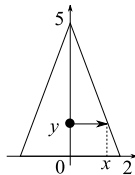
$$y = x - 2$$

intersect?

- ☐ A) (4, 2)
- ☐ B) -1 and 4
- ☐ C) 4
- ☐ D) (-1, -3) and (2, 4)
- ☐ E) (1, 1)

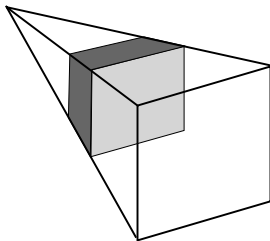
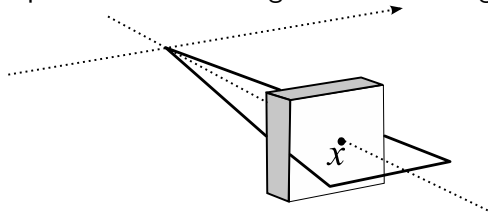
Example 3

The volume of a cone of height H and base of radius R is $\frac{1}{3}\pi HR^2$. Verify this formula for a cone of height 5 and base radius 2.



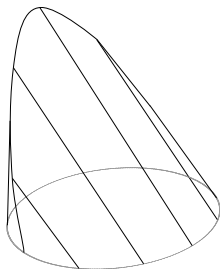
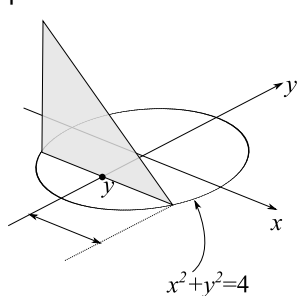
Example 4

Find the volume of the pyramid with square cross-sections. The base square has side of length 2 and the height of the pyramid is 3.



Example 5

Find the volume of the shape with circular base of radius 2, whose perpendicular cross-sections are **isosceles** right-triangles, as shown on the picture.

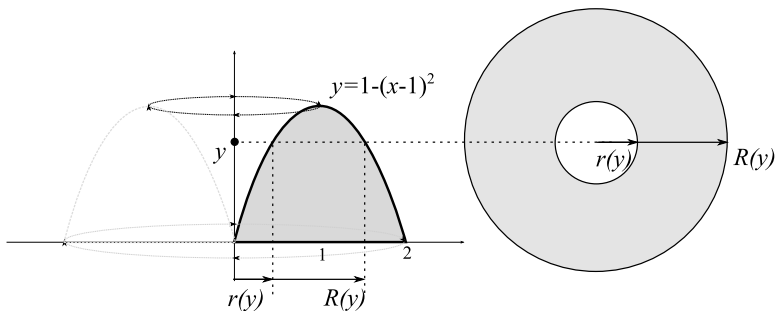


$$V = \sum A_y.$$

For a cross-section through y : $A_y \approx \frac{l(y)^2}{2}$, where $l(y)$ = side of triangle.

Computing volumes: Example 6

Find the volume of the “Bundt cake” obtained by rotating the graph of $y = 1 - (x - 1)^2$ on $[0, 2]$ about the y -axis



Wrapping up:

- For next time read section 8.2.
- Solve the problems from section 8.1 (try problems from 8.2 too).
- Quiz on Thursday (February 21) will cover section 8.1.
- The deadline for passing the Gateway exam is Friday, February 22. The Gateway counts for 7% of the grade.