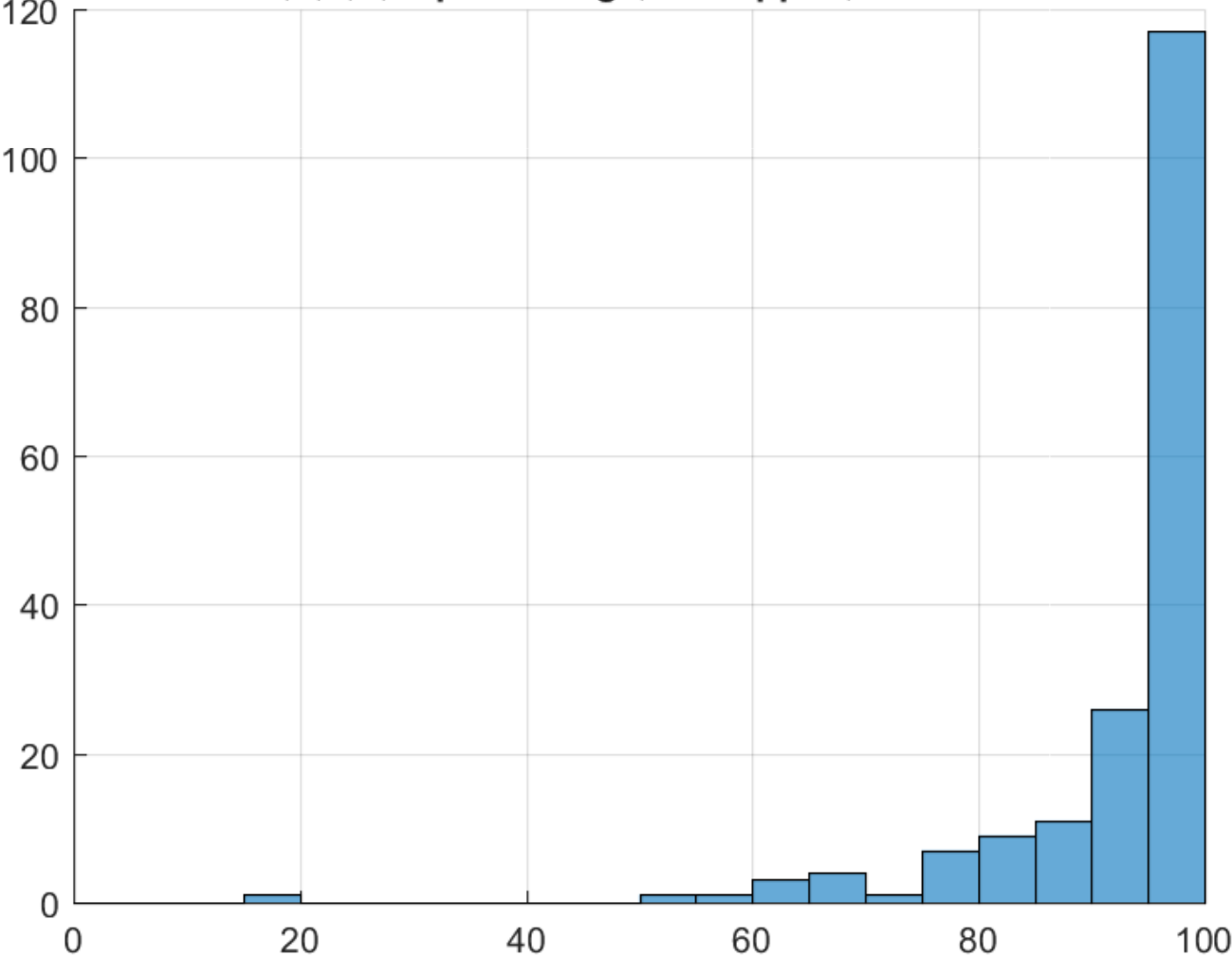
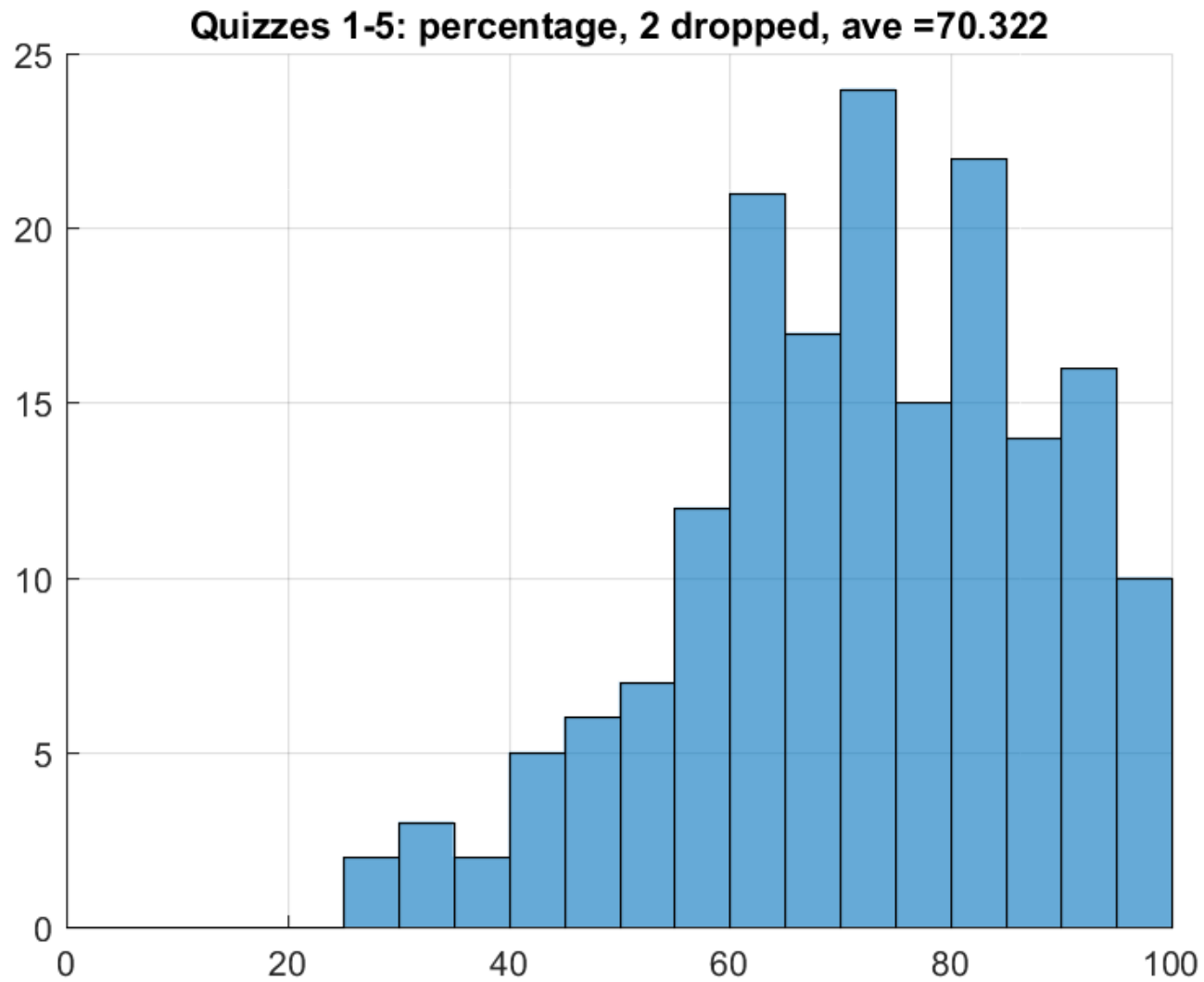


MAT 126.01, Prof. Bishop, Thursday, Oct 15, 2020
Midterm 2 review

HW 1,2,3,5,6: percentage, 2 dropped, ave=93.4329

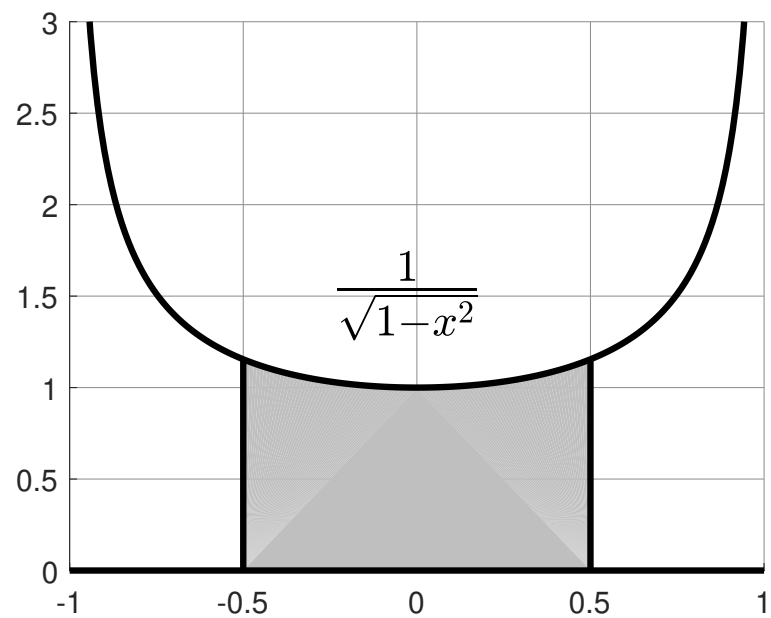




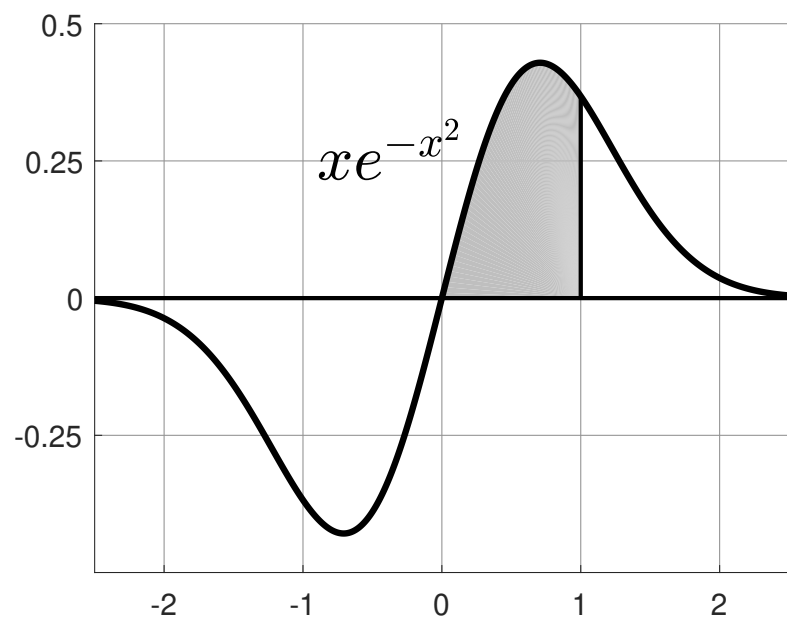
Midterm 2: 25 multiple choice questions on 6 pages.

- Page 1: 4 integrations involving exponential, logarithms, inverse trig functions.
- Page 2: 2 matching formulas/figures (area between graphs), 2 computing areas.
- Page 3: 4 matching formulas/figures, volumes of revolution (
- Page 4: 4 problems on volumes of revolution (2 disks, 2 shells)
- Page 5: 5 problems on volume, arclength and area.
- Page 6: is 4 problems on physical applications (lifting and population).

Compute the area of the shaded region.



Compute the area of the shaded region.

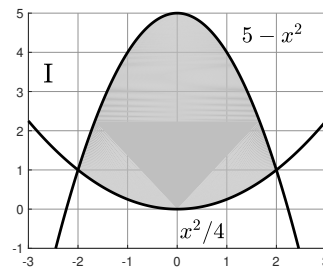
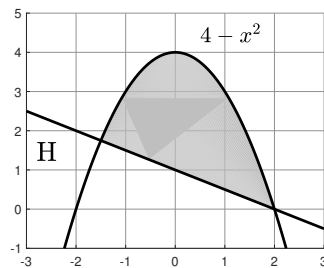
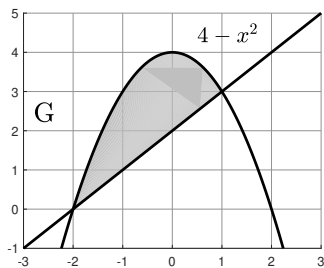
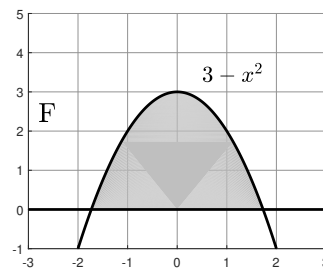
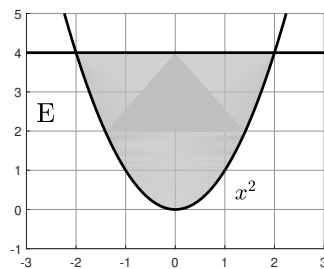
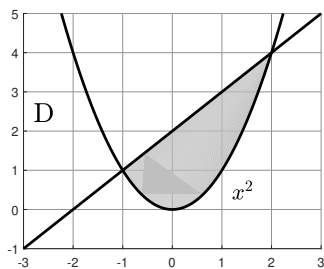
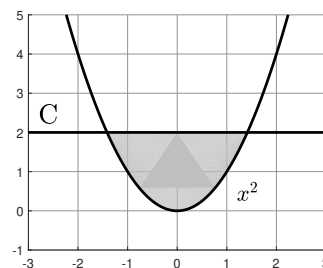
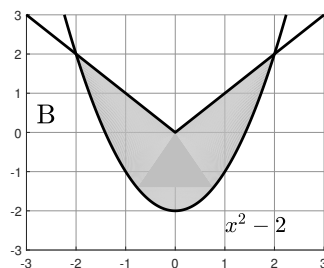
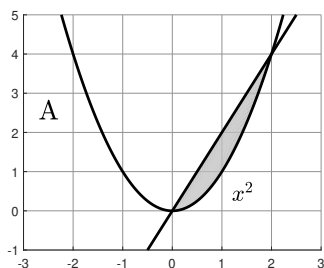


Compute the indefinite integral of $f(x) = \tan(x) \ln \sec(x)$.

Match each formula for the area to the region it describes.

$2 \int_0^2 2 + x - x^2 dx$

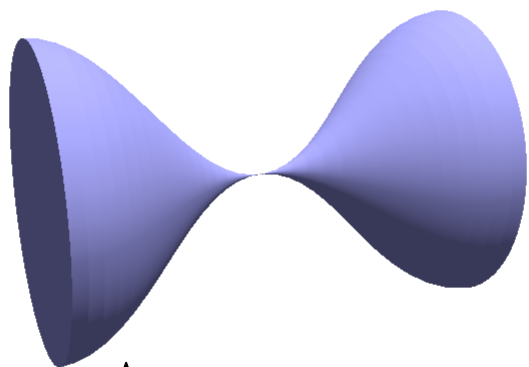
$\int_{-2}^2 4 - x^2 dx$



Compute the shaded area of picture H.

Match each formula with the picture of its graph rotated around the x -axis.

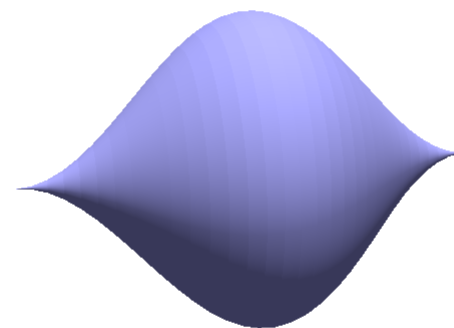
\sqrt{x} on $[0, \pi]$



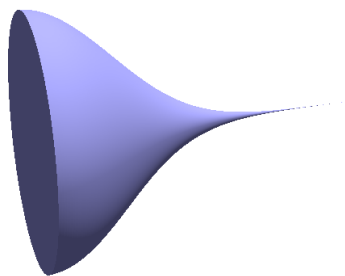
A



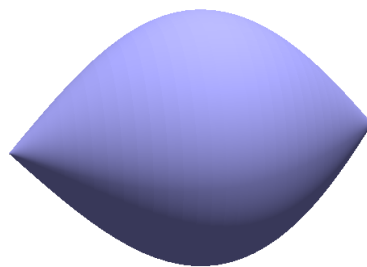
B



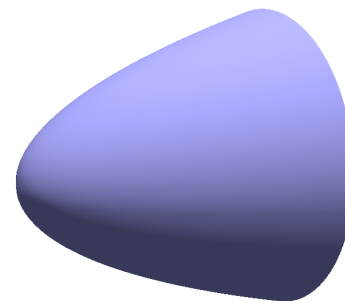
C



D



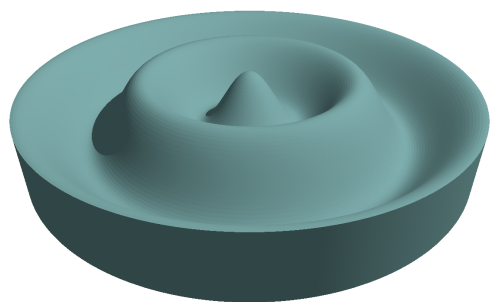
E



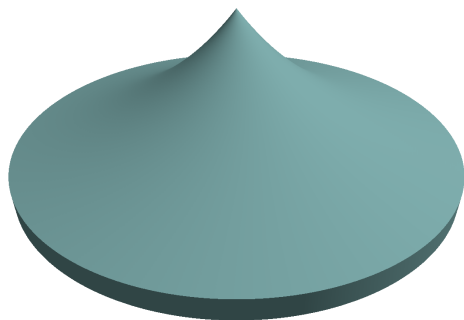
F

Match each formula with the picture of its graph rotated around the y -axis.

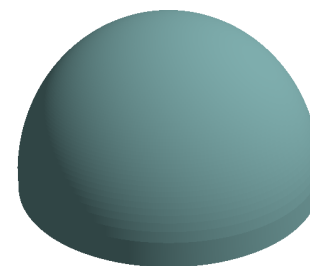
$\sin(x)/x$ on $[0, 20]$



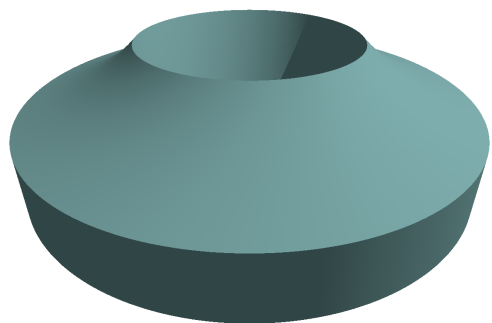
A



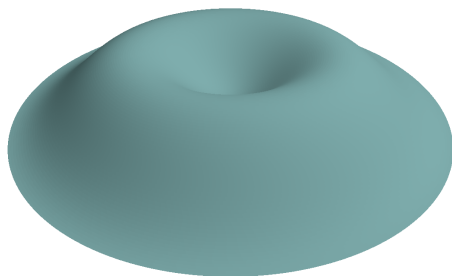
B



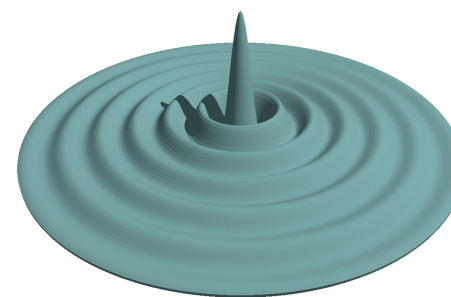
C



D

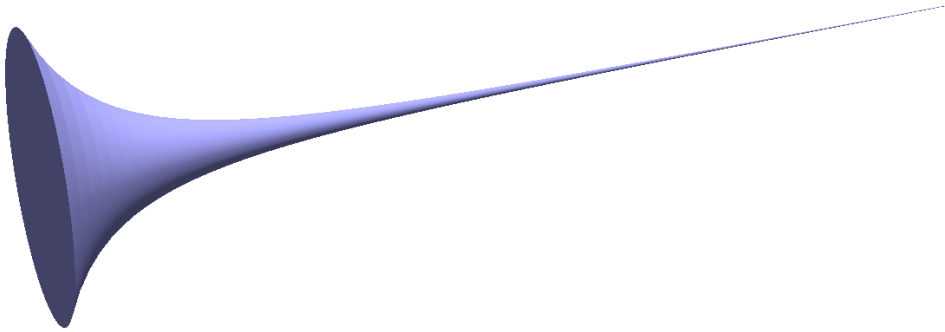


E



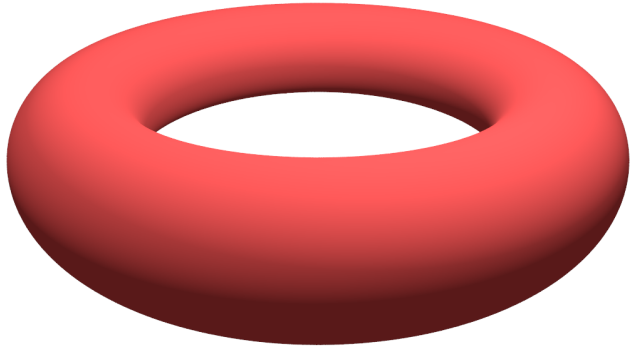
F

The region below is $\{0 \leq y \leq e^{-2x} : 0 \leq x < \infty\}$, rotated around the x -axis. What is the integral formula for the volume using the disk method?



Compute the volume.

The region below is the disk of radius 2 centered at $x = 6, y = 0$ rotated around the y -axis. Using the method of cylindrical shells, the volume is given by which integral?



The region $\{(x, y) : |y| \leq \sqrt{x}, 0 \leq x \leq 2\}$ is rotated around the y axis.
What is the volume?

The base of 3 dimensional shape is $\{(x, y) : 0 < y < 1 - |x|\}$ and each cross section of the shape perpendicular to the x -axis is a vertical square with one edge on the xy -plane. What is the volume of this region?

Which integral gives the arclength of the graph of $y = \ln(x)$ over $[1, 2]$?

Which integral gives the area of the graph of $y = \ln(x)$ over $[1, 2]$ rotated around the x -axis?

What is integral when we rotate around the y -axis?

A pile of sand is shaped like a cone 40 feet high and a circular base 100 feet in diameter. What is the volume of the sand pile?

Suppose sand weights 75 lbs per cubic foot. How much work (in foot-pounds) is done lifting the sand from ground level to build cone?

The population density of a town is estimated to be $20000e^{-x/2}$ people per square mile, where x is the distance in miles from the city center. Which integral gives the number of people living within 10 miles of the city center?