today:

midterm: 5.1 - 5.6, 6.1
homework 2 due (5.5.36, 5.5.74, 5.6.4, 5.review.38, 6.1.32, 6.1.48)
§ 6.2 - volumes

thursday:

§ 6.3 - volumes by cylindrical shells
(special guest lecturer Jim)

tuesday:

§ 6.4 - applications
quiz: 6.1 - 6.2

wednesday, 21 october:
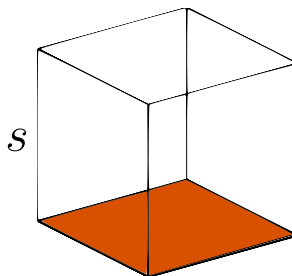
webwork 3 due

thursday, 22 october:

§ 7.1 - integration by parts
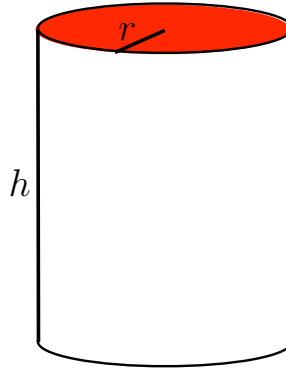§ 7.2 - trigonometric integrals
homework 3 due (§ 6.2, § 6.3)

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example i

- what is the volume of a cube with sides of length s?

- volume = s^3

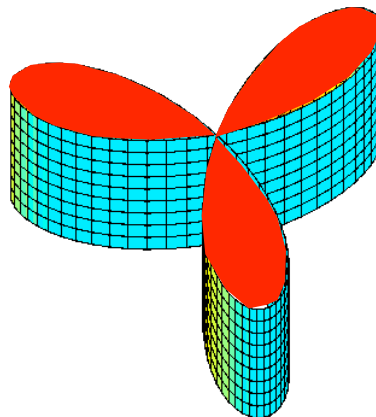- base area = s^2

- vol = (base area)(height)

example ii

- what is the volume of a
  cylinder with radius r
  and height h?

- volume = $\pi\, r^2\, h$

- base area = $\pi\, r^2$

- vol = (base area)(height)

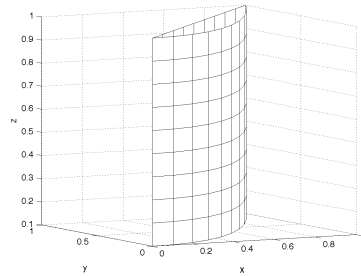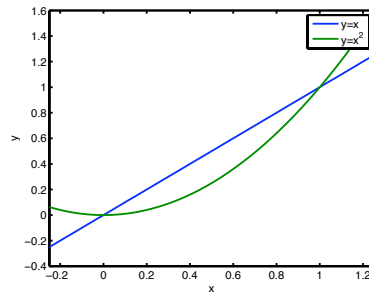# fact

- a shape with uniform
  cross sections is called a
  generalized cylinder

- the volume of a
  generalized cylinder is
  the cross-sectional area
  times the height

example iii

- Find the volume of the generalized cylinder of height 1 with base bounded by $y = x^2$ and $y = x$.
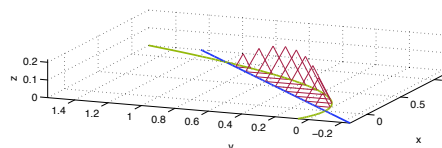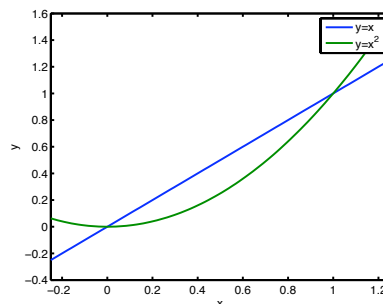

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example iv
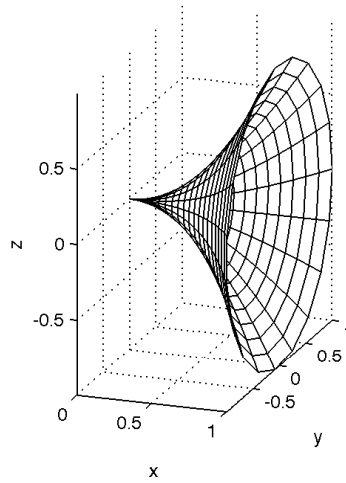
- Suppose the base of a figure is bounded by the curves $y = x^2$ and $y = x$.

- Suppose further that cross-sections parallel to the y axis and perpendicular to the x y plane are equilateral triangles.

- Find the volume of the figure.

example v

- Consider the solid generated by rotating the area under the curve $y = x^2$ between $x = 0$ and $x = 1$ about the x axis.

- What is this solid's volume?

- Note: The cross sections are circular.

next time

- read § 6.3