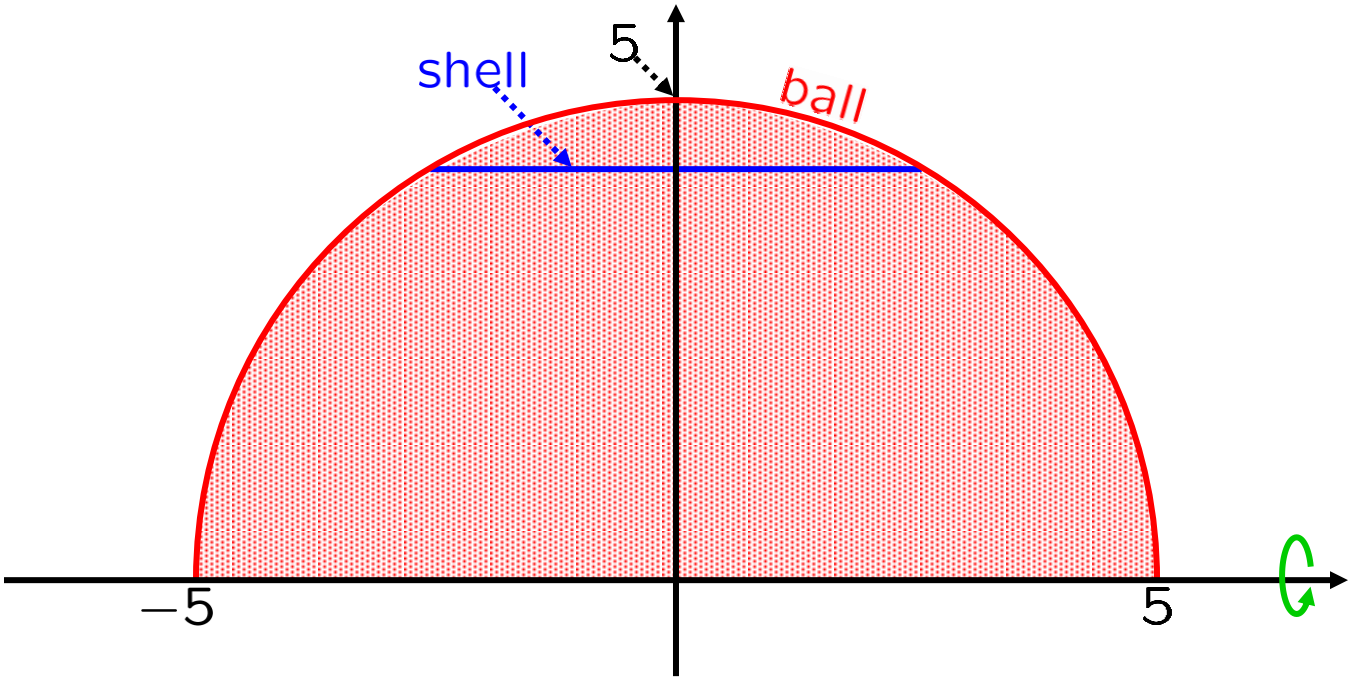
CALCULUS
Volume by cylindrical shells: Problems
OLD

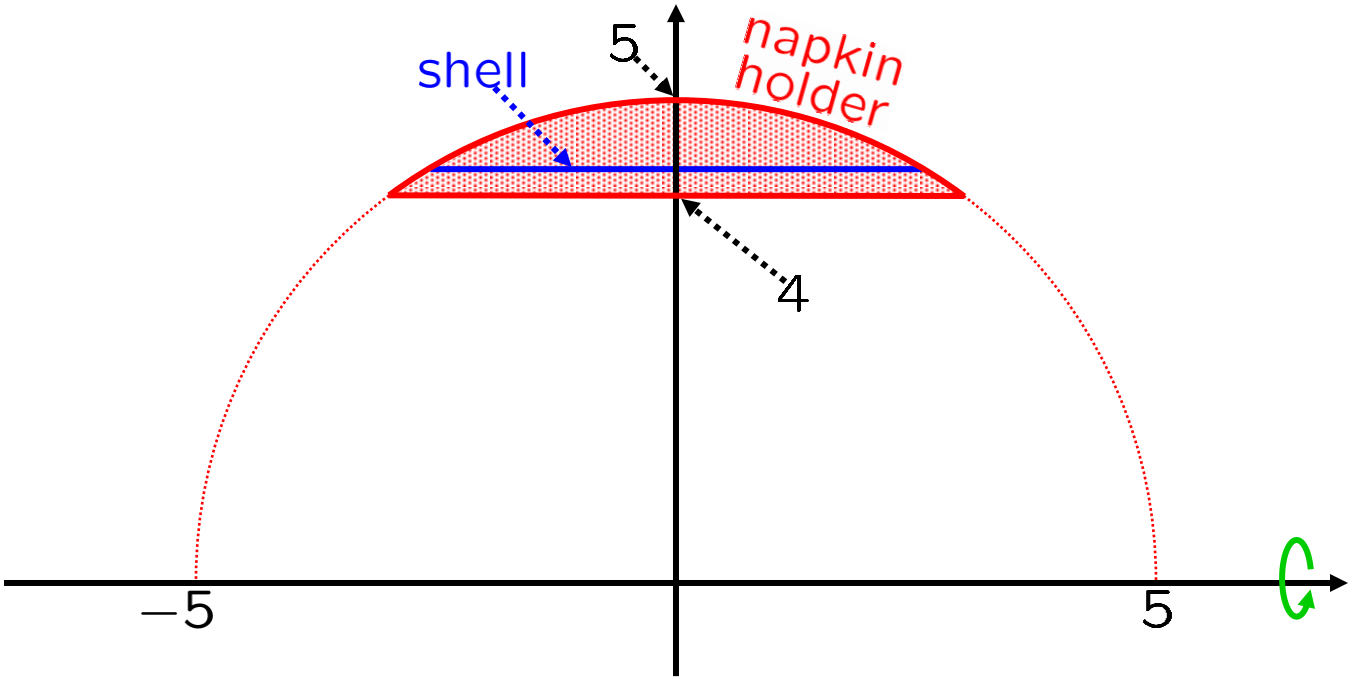
OLD

0750-1. Using the shell method, find the volume in a ball of radius 5, following the diagram shown below.



OLD

0750-2. We create a napkin holder by drilling a cylindrical hole of radius 4 through the middle of a ball of radius 5, as shown below. Using the shell method, find its volume.



0750-3. OLD Let R be the region bounded by

$$y = (x-1)^2(x-2)^2 \text{ and } y = 4.$$

a. Sketch R.

b. Using whatever method you prefer, set up an integral to compute the volume of the solid obtained by rotating R about the x-axis. Do not evalute the integral.

c. Using whatever method you prefer, set up an integral to compute the volume of the solid obtained by rotating R about the y-axis. Do not evalute the integral.

d. Using whatever method you prefer, set up an integral to compute the volume of the solid obtained by rotating R about the line $x = -1$. Do not evalute the integral.

0750-4. OLD Let R be the region bounded by $x = 1 + e^{-y^2}$, $x = 0$, $y = 1$ and $y = 2$.

a. Sketch R.

b. Using whatever method you prefer, find the volume of the solid obtained by rotating R about the x-axis.

0750-5. OLD Let R be the region bounded by $x = y^2 + y$, $x = 0$, $y = 1$ and $y = 2$.

a. Sketch R.

b. Using whatever method you prefer, find the volume of the solid obtained by rotating R about the line $x = -1$.

0750-6. Let R be the region bounded by $x = \sin y$, $x = 0$, $y = \pi/4$ and $y = 3\pi/4$.
OLD

Set up, but do not evaluate, an integral that yields the volume of the solid obtained by rotating R about the line $y = \pi$.

0750-7. Describe the solid of revolution whose volume is given by
OLD

$$2\pi \int_1^2 x \left[\left(e^{5x} \right) - (\cos(\pi x)) \right] \, dx.$$

Do not evaluate this integral.

0750-8. Describe the solid of revolution whose volume is given by
OLD

$$2\pi \int_1^2 [x + 3] \left[\left(e^{5x} \right) - (\cos(\pi x)) \right] \, dx.$$

Do not evaluate this integral.