3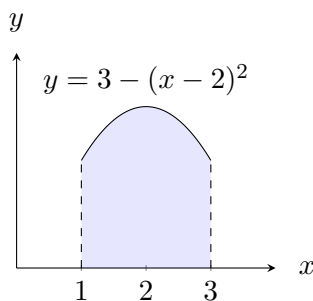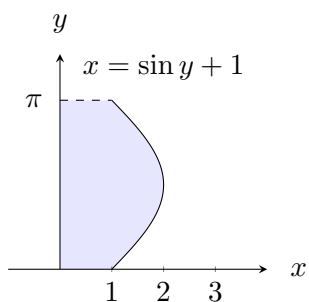. [15 points] Flora and Nile are collecting fruits in the forest and they have brought several containers of different shapes. **Write an integral** that computes the volume of each of the following containers. **Do not evaluate your integrals.**

    a. [5 points] The first container is in the shape formed by revolving the following region about the y-axis.

y

$y = 3 - (x-2)^2$

x

1 2 3

    b. [5 points] The second container is in the shape formed by revolving the following region about the line $x = 3$.

y

$x = \sin y + 1$

π

x

1 2 3

    c. [5 points] The third container has a circular base with equation $x^2 + y^2 = 4$ (of radius 2 centered at the origin), with **square** cross-sections perpendicular to the x-axis.

y

2

1

base

x

-2 -1 1   2

-1

-2