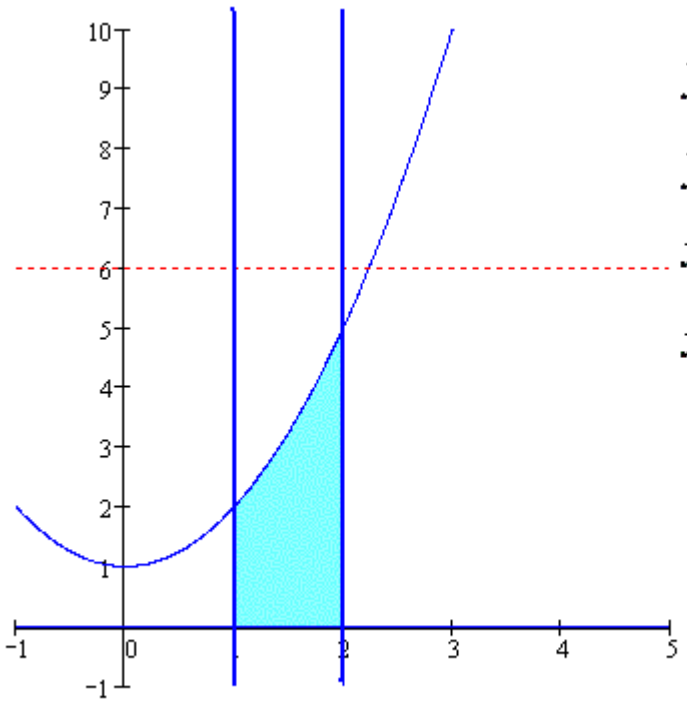
Set-up the integral for the volume…
First, revolve about $y = 6$



Two methods:

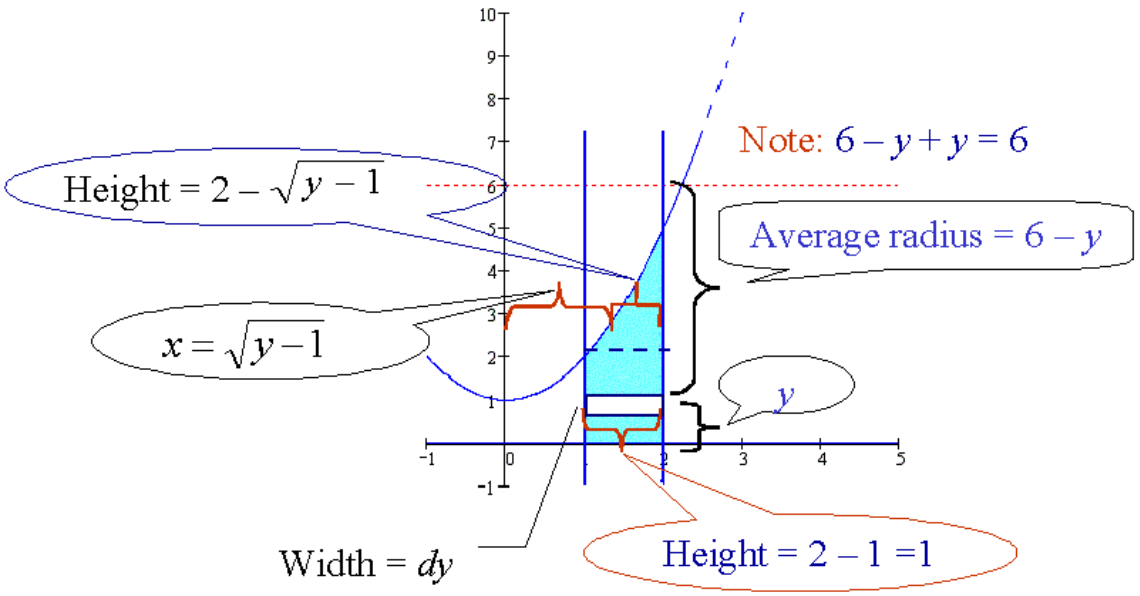
a) Shell

What information do you need?

b) Disk or washer

What information do you need?

Shell Method: *height of shell is parallel to line rotation* $y = 6$



$$V = 2\pi \int_a^b (AverageRadius)(Height)dy$$

$$V = 2\pi \int_0^2 (6-y)(1)dy + 2\pi \int_2^5 (6-y)(2-\sqrt{y})dy$$

Note: $f(x) = x^2 + 1$

Limits: if $x = 1$, $f(1) = 1^2 + 1 = 2$

if $x = 2$, $f(2) = 2^2 + 1 = 5$