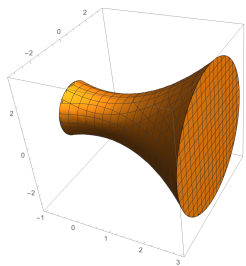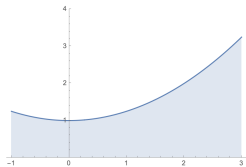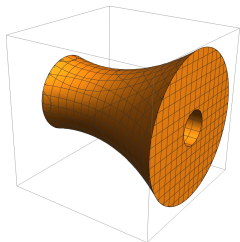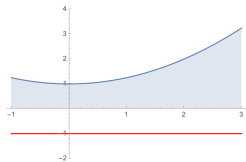# Find the volume of the solid formed when the region bounded by $y = \frac{x^2}{4} + 1$ and the x-axis for $-1 \le x \le 3$ is rotated about the x-axis

Find the volume of the solid formed when the region bounded by $y = \frac{x^2}{4} + 1$ and the x-axis for $-1 \leq x \leq 3$ is rotated about the line $y = -1$

Suggestions for volumes of solids of revolution

- Sketch the region *R* that is being rotated and the line *R* is rotated about

- Sketch the solid after *R* is rotated

- Write integral as Volume = $\displaystyle\int_a^b A(x)\ dx.$ To find *A*(*x*):
  - Draw a vertical cross-section at an arbitrary *x*-value
  - Use this to write an expression for *A*(*x*)

- Use whatever you need in your toolbox to evaluate $\displaystyle\int_a^b A(x)\ dx$

Sketch each solid described, and set up the integral that gives its volume

1. The solid formed when the region bounded by $y = 4 - 2x$, the x-axis and the y-axis is rotated about the x-axis

2. The solid formed when the region bounded by $y = x^2 + 1$ and $y = x + 3$ is rotated about the x-axis

3. The volume when the region from #2 is rotated about the line $y = 8$

If you have time, go back and calculate the integrals you've set up.