

6. [11 points] Louise, a world-famous abstract artist and cheese enthusiast, is experimenting with new designs for cheese sculptures. She has two ideas for a cheese sculpture and would like to know the volume of each one so that she knows how much cheese to buy.

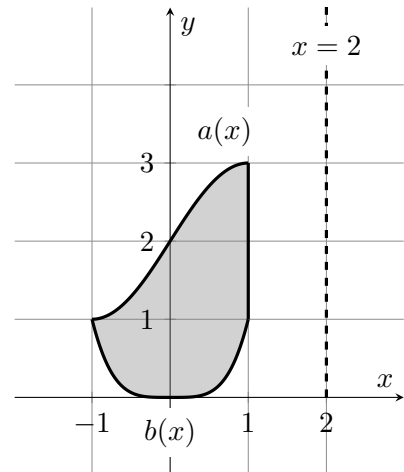
- a. [6 points] Louise's first idea involves the shaded region to the right, which is bounded by the line  $x = 1$  and the curves

$$a(x) = 2 + \sin\left(\frac{\pi}{2}x\right) \quad \text{and} \quad b(x) = x^4$$

on the interval  $[-1, 1]$ .

Write an integral that represents the volume of the solid formed by rotating this region around the line  $x = 2$ .

**Do not evaluate your integral.** Your answer should not involve the letters  $a$  or  $b$ .



**Answer:** \_\_\_\_\_

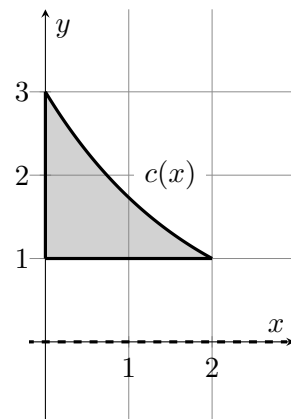
- b. [5 points] Louise's second idea involves the shaded region to the right, bounded by the curve

$$c(x) = (\sqrt{3})^{2-x},$$

the  $y$ -axis, and the line  $y = 1$  on the interval  $[0, 2]$ .

Write an integral that represents the volume of the solid formed by rotating this region around the  $x$ -axis.

**Do not evaluate your integral.** Your answer should not involve the letter  $c$ .



**Answer:** \_\_\_\_\_