1. §6.1: Problems 21, 23.
   (a) Sketch a graph of the region.
   (b) Choose an axis of integration and write down your choice.
   (c) Draw a typical slice of volume and label its dimensions.
   (d) Find the volume of the slice. Write it in terms of the integration variable.
   (e) Express the total volume as an integral or a sum of integrals. If you use more
       than one integral, repeat (b)–(d) as needed.
   (f) Compute the integral(s).

2. §6.1: Problem 21*. Complete the usual steps but this time rotate the region about the
   line $x = \pi$.

3. §6.1: Problem 23*. Complete the usual steps but this time rotate the region about the
   $y$-axis.

4. §6.1: Problem 13. Complete the usual steps but this time rotate the region about the
   line $x = a$, assuming $a$ is somewhere to the right of $x = 2$.

5. §6.1: In the previous problem assume the $x$- and $y$-axes are measured in centimeters.
   If the volume of the solid is 20 cm$^3$, what is $a$?

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Hints and Answers

2) Approximately 18.7.
3) $2\pi(1 - 4/e) \approx 1.66$.
4) Check your answer by working Problem 5.
5) $10/\pi + 2/3 \approx 3.85$ cm.

*Follow the Type 2 Integration Instructions found on the homework website. Graded homework and
exams would say “set up but do not evaluate an integral...”. You can skip step (f) if you want, but then you
can’t check your answer. I recommend asking your calculator for a numerical approximation.