math 152 exercises

1. If \( f(x) = \sqrt{x}, \ x \in [0, 1]; \ g(x) = x^2, \ x \in [0, 1]. \)

   (a) Find the volume resulted by rotating the area bounded by \( y = f(x) \)
   and \( y = g(x) \) around the \( x - axis \).

   (b) Find the volume resulted by rotating the area bounded by \( y = f(x) \)
   and \( y = g(x) \) around the \( y = 3 \).

   (c) Find the volume resulted by rotating the area bounded by \( y = f(x) \)
   and \( y = g(x) \) around the \( y = -3 \).

2. Repeat number 1 for \( f(x) = \sqrt{x}, \ x \in [0, 1]; \ g(x) = x^2, \ x \in [0, 1]. \)

3. Repeat number 1 for \( f(x) = \sin x, \ x \in [0, \pi]; \ g(x) = x, \ x \in [0, \pi]. \)

4. For \( f(x) = \sqrt{1 - x^2} + 2, \ x \in [-1, 1]; \ g(x) = -\sqrt{1 - x^2} + 2, \ x \in [-1, 1], \) find
   the volume by rotating the bounded area by \( y = f(x) \) and \( y = g(x) \) around
   \( x - axis \). (You only need to set up the integral(s).)