1. Use cavalieri’s principle to compute the volume of a sphere of radius \( R \). (Hints: (i) Recall Cavalieri’s principle: \( V = \int_a^b A(x) \, dx \), (ii) write a formula for \( A(x) \) in terms of \( r \) (look at the above figure), (iii) write \( r \) in terms of \( R \) and \( x \), and (iv) integrate.)

2 (Bonus). Repeat the previous problem for a right circular cone with height \( h \) and base radius \( R \).

*First problem is worth 10 points, and so is the quiz; however, you may get up to 5 extra points for the second problem.*