Cavalieri’s Principle - Independent Practice Worksheet

Complete all the problems. Make sure to draw pictures to help you solve the problems.

1. Calculate the volume of the “globe” with circular cross-sectional area equal to \(\pi \sqrt{x^4}\) above \(x\) in the interval \([0, 1]\).

2. Calculate the volume of the “ball” with circular cross-sectional area equal to \(\pi \sqrt{x^6}\) above \(x\) in the interval \([0, 1]\).

3. Calculate the volume of the “egg” with circular cross-sectional area equal to \(\pi \sqrt{x^8}\) above \(x\) in the interval \([0, 1]\).

4. Calculate the volume of the “lemon” with circular cross-sectional area equal to \(\pi \sqrt{x^{10}}\) above \(x\) in the interval \([0, 1]\).

5. Calculate the volume of the “coin” with circular cross-sectional area equal to \(\pi \sqrt{x^9}\) above \(x\) in the interval \([0, 1]\).

6. Let \(A(x) = \sqrt{x^3}\) describes the area of a cross-section of a block at \(x\) (perpendicular to the \(x\)-axis). Find the volume of block from \(x=0\) to \(x=1\).

7. Let \(A(x) = \sqrt{x^9}\) describes the area of a cross-section of a stone at \(x\) (perpendicular to the \(x\)-axis). Find the volume of stone from \(x=0\) to \(x=1\).

8. Let \(A(x) = \sqrt{x^4}\) describes the area of a cross-section of a brick at \(x\) (perpendicular to the \(x\)-axis). Find the volume of brick from \(x=0\) to \(x=1\).

9. Let \(A(x) = \sqrt{x^6}\) describes the area of a cross-section of a ice at \(x\) (perpendicular to the \(x\)-axis). Find the volume of ice from \(x=0\) to \(x=1\).

10. Let \(A(x) = \sqrt{x^{11}}\) describes the area of a cross-section of a cake at \(x\) (perpendicular to the \(x\)-axis). Find the volume of cake from \(x=0\) to \(x=1\).

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