# Volumes of Solids of Revolution - Answer Key

Find an integral expression for the volume of the solid obtained by rotating region $R$ around the line $L$.

1. $R$ : the region bounded by $y = x$ and $y = \sqrt{x}$; $L : x = 2$.
   $\pi \int_0^1 \left[(2 - y^2)^2 - (2 - y)^2\right]^2 dy.$

2. $R$ : the region bounded by $y = x$ and $y = \sqrt{x}$; $L : x = 2$.
   $\pi \int_0^1 \left[(\sqrt{x} + 2)^2 - (x + 2)^2\right]^2 dx.$

3. $R$ : the region bounded by $y = 1 - x^2$, $y = 1$ and $x = 1$; $L : x = 0$.
   $\pi \int_0^1 \left[1 - (1 - y)^2\right]^2 dy.$

4. $R$ : the region bounded by $y = 1 - x^2$, $y = 1$ and $x = 1$; $L : x = 1$.
   $\pi \int_0^1 \left[1 - \sqrt{1 - y}\right]^2 dy.$

5. $R$ : the region bounded by $y = 1 - x^2$, $y = 1$ and $x = 1$; $L : x = 2$.
   $\pi \int_0^1 \left[(2 - \sqrt{1 - y})^2 - (1)^2\right] dy.$

6. $R$ : the region bounded by $y = 1 - x^2$, $y = 1$ and $x = 1$; $L : x = -0.5$.
   $\pi \int_0^1 \left[(1.5)^2 - (0.5 + \sqrt{1 - y})\right] dy.$

7. $R$ : the region bounded by $y = \sqrt{x}$ $x = 1$ and $y = 0$; $L : y = 0$.
   $\int_0^1 2\pi y(1 - y^2) dy.$

8. $R$ : the region bounded by $y = x^2$ and $y = 2x$; $L : x = 3$.
   $\int_0^1 2\pi(3 - x)(2x - x^2) dx.$

9. $R$ : the region bounded by $y = x^2$ and $y = 2x$; $L : y = 0$.
   $\int_0^1 2\pi y \left(\sqrt{y} - \frac{y}{2}\right) dy.$

10. $R$ : the region bounded by $y = x^2$ and $y = 2x$; $L : y = 7$.
    $\int_0^1 2\pi(7 - y) \left(\sqrt{y} - \frac{y}{2}\right) dy.$

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