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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