5.2 Volumes - Extra Practice Problems

1. Find the volume of the solid obtained by rotating the region below $f(x) = 9 - x^2$, for $0 \le x \le 3$, about the line $x = -2$.

2. Find the volume of the solid obtained by rotating the region between the curve $f(x) = 9 - x^2$ and the line $y = 2$ for $0 \le x \le 3$, about the line:
   a). $y = 12$;
   b). $y = 15$.

3. Find the volume of the solid obtained by rotating the region between the curves $y = x^2 + 2$ and $y = 4 - x^2$ about the line $y = -3$.

4. Find the volume of the solid obtained by rotating the region under $y = x^2 + 2$, for $0 \le x \le 2$, about
   a). The x-axis;
   b). $y = 6$.

5. Find the volume of the solid obtained by rotating the region enclosed by the curves $y = \frac{1}{x}$ and $y = \frac{5}{2} - x$ about the y-axis.

6. Find the volume of the solid obtained by rotating the region enclosed by the curves:

$$y = 16 - x; \ y = 3x + 12; \ x = 0,$$

about the y-axis.

Answers:
   1. $\frac{225\pi}{2}$.
   2. a. $\frac{648\pi}{5}$; b. $\frac{1188\pi}{5}$.
   3. 32π.
   4. a. $\frac{376\pi}{15}$; b. $\frac{824\pi}{15}$.
   5. $\frac{9\pi}{8}$.
   6. $\frac{4\pi}{3}$.