

# Worksheet: Volumes of Solids of Revolution Using the Shell Method



**Q1:** Find the volume of the solid obtained by rotating the region bounded by the curves  $5y = x$ ,  $y = 0$ ,  $x = 3$ , and  $x = 4$  about  $x = 2$ .

- A  $\frac{7\pi}{10}$
- B  $\frac{\pi}{3}$
- C  $\frac{64\pi}{15}$
- D  $\frac{32\pi}{15}$
- E  $\frac{2\pi}{3}$

**Q2:** Consider the region bounded by the curve  $xy = 4$  and lines  $y = 0$ ,  $x = 1$ , and  $x = 2$ . Find the volume of the solid obtained by rotating this region about  $x = -5$ . Round your answer to two decimal places.

- A 8.71
- B 30.55
- C 61.11
- D 112.24
- E 224.47

**Q3:** Consider the region in the half plane  $y \geq 0$  bounded by the curves  $y = 4x^2$  and  $x^2 + y^2 = 7$ . Find the volume of the solid obtained by rotating this region about  $y$ -axis. Round your answer to two decimal places.

A 13.76

B 5.25

C 27.53

D 2.62

E 1.67

**Q4:** Calculate the volume of a solid generated by rotating the region bounded by the curve  $y = 2 - 7x^2$  and straight lines  $x = 1$  and  $y = 4$  a complete revolution about the  $y$ -axis.

A  $\frac{45}{7}$  volume units

B  $\frac{45}{14}$  volume units

C  $\frac{45\pi}{7}$  volume units

D  $\frac{45\pi}{14}$  volume units

**Q5:** Calculate the volume of a solid generated by rotating the region bounded by the curve  $y = 5x^2 - 2$ , the  $y$ -axis, and the straight line  $y = 1$  a complete revolution about the  $y$ -axis.

- A  $\frac{9\pi}{10}$  volume units
- B  $117\pi$  volume units
- C 117 volume units
- D  $\frac{9}{10}$  volume units

**Q6:** Find the volume of the solid obtained by rotating the region bounded by the curve  $y = x^3$  and the lines  $y = 1$  and  $x = 2$  about the line  $y = -1$ .

- A  $\frac{120\pi}{7}$
- B  $\frac{240\pi}{7}$
- C  $\frac{317\pi}{14}$
- D  $\frac{317\pi}{7}$
- E  $\frac{11\pi}{4}$

**Q7:** Determine the volume of the solid generated by rotating the region bounded by the curve  $y = 7x^2$  and the line  $y = 7x$  a complete revolution about the  $x$ -axis.

- A  $\frac{196\pi}{15}$  cubic units
- B  $\frac{637\pi}{4}$  cubic units
- C  $\frac{98\pi}{15}$  cubic units
- D  $\frac{637\pi}{2}$  cubic units



Question Video

**Q8:** Consider the region bounded by the curves  $y = x^3$  and  $y = x$ , for  $x \geq 0$ . Find the volume of the solid obtained by rotating this region about the  $x$ -axis.

- A  $\frac{\pi}{7}$
- B  $\frac{\pi}{3}$
- C  $\frac{\pi}{4}$
- D  $\frac{4\pi}{21}$
- E  $\frac{8\pi}{21}$



Question Video

**Q9:** Find the volume of the solid generated by turning the region bounded by the curves  $y = 4\sqrt{x}$ ,  $y = -8$ , and  $x = 5$  a complete revolution about the  $x$ -axis.

A  $72\pi$  cubic units

B 18 cubic units

C 72 cubic units

D  $18\pi$  cubic units

**Q10:** Find the volume of the solid generated by turning the region bounded by the curves  $y = \frac{1}{8x}$ ,  $y = -4$ ,  $y = -6$ , and the  $y$ -axis through a complete revolution about the  $x$ -axis.

A  $\frac{5\pi}{768}$  cubic units

B  $\frac{\pi}{384}$  cubic units

C  $\frac{\pi}{768}$  cubic units

D  $\frac{\pi}{1,536}$  cubic units

**Q11:** Find the volume of the solid generated by revolving the region bounded by the curve  $y = 8x$  and the straight lines  $y = -4$  and  $x = 0$  a complete revolution about the  $y$ -axis.

A  $\frac{8\pi}{3}$  cubic units

B  $\pi$  cubic units

C  $\frac{1}{3}$  cubic units

D  $\frac{8}{3}$  cubic units

E  $\frac{\pi}{3}$  cubic units