

## Volume Washer - about Axes!

Date \_\_\_\_\_ Period \_\_\_\_\_

For each problem, find the volume of the solid that results when the region enclosed by the curves is revolved about the the given axis.

1)  $y = -x - 4$ ,  $y = -x^2 - 2$ ,  $x = 0$ ,  $x = 1$   
Axis:  $y = -1$

2)  $y = -x^2 + 3$ ,  $y = 2$ ,  $x = 0$ ,  $x = 1$   
Axis:  $y = 1$

3)  $y = -4$ ,  $y = -x^2 - 3$ ,  $x = 0$ ,  $x = 1$   
Axis:  $y = 1$

4)  $y = -x^2 + 4$ ,  $y = 0$ ,  $x = 0$ ,  $x = 2$   
Axis:  $y = -1$

5)  $y = -x^2 + 7$ ,  $y = x + 5$ ,  $x = 0$ ,  $x = 1$   
Axis:  $y = 2$

6)  $x = y^2 - 6$ ,  $x = -y^2 - 4$ ,  $y = -1$ ,  $y = 0$   
Axis:  $x = -1$

7)  $x = -y^2 + 8$ ,  $x = 4$   
Axis:  $x = 2$

8)  $x = -y^2 + 4$ ,  $x = 3$ ,  $y = 0$ ,  $y = 1$   
Axis:  $x = 1$

9)  $x = \sqrt{y} + 2$ ,  $x = \frac{y}{2} + 2$

Axis:  $x = -1$

10)  $x = \sqrt{y} + 2$ ,  $x = y^2 + 2$

Axis:  $x = -2$

## Answers to Volume Washer - about Axes! (ID: 1)

$$1) \pi \int_0^1 ((3+x)^2 - (1+x^2)^2) dx$$

$$= \frac{157}{15}\pi \approx 32.882$$

$$2) \pi \int_0^1 ((-x^2+2)^2 - 1) dx$$

$$= \frac{28}{15}\pi \approx 5.864$$

$$3) \pi \int_0^1 (5^2 - (4+x^2)^2) dx$$

$$= \frac{92}{15}\pi \approx 19.268$$

$$4) \pi \int_0^2 ((-x^2+5)^2 - 1) dx$$

$$= \frac{416}{15}\pi \approx 87.127$$

$$5) \pi \int_0^1 ((-x^2+5)^2 - (x+3)^2) dx$$

$$= \frac{143}{15}\pi \approx 29.95$$

$$6) \pi \int_{-1}^0 ((5-y^2)^2 - (3+y^2)^2) dy$$

$$= \frac{32}{3}\pi \approx 33.51$$

$$7) \pi \int_{-2}^2 ((-y^2+6)^2 - 2^2) dy$$

$$= \frac{384}{5}\pi \approx 241.274$$

$$8) \pi \int_0^1 ((-y^2+3)^2 - 2^2) dy$$

$$= \frac{16}{5}\pi \approx 10.053$$

$$9) \pi \int_0^4 \left( (\sqrt{y}+3)^2 - \left(\frac{y}{2}+3\right)^2 \right) dy$$

$$= \frac{32}{3}\pi \approx 33.51$$

$$10) \pi \int_0^1 \left( (\sqrt{y}+4)^2 - (y^2+4)^2 \right) dy$$

$$= \frac{89}{30}\pi \approx 9.32$$