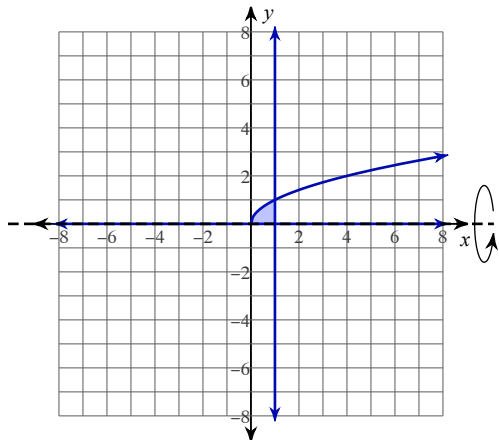


VOLUME OF A SOLID - DISK METHOD

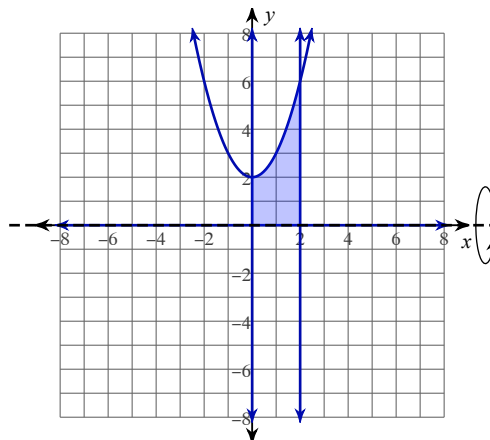
Date _____ Period _____

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

1) $y = \sqrt{x}$, $y = 0$, $x = 1$



2) $y = x^2 + 2$, $y = 0$, $x = 0$, $x = 2$



3) $y = -x^2 + 4$, $y = 0$

4) $y = \frac{2}{x}$, $y = 0$, $x = 1$, $x = 6$

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.

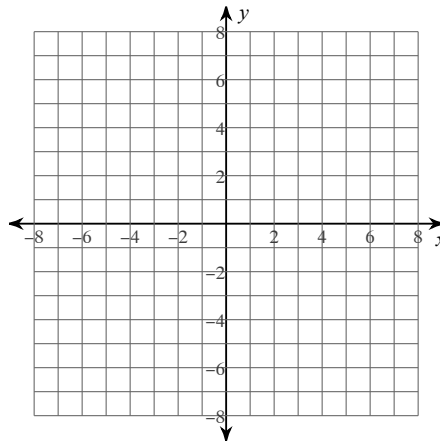
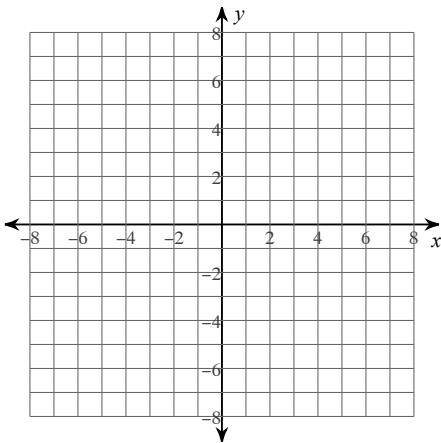
5) $y = -x^2 + 5$, $y = 1$, $x = 0$, $x = 2$
 Axis: $y = 1$

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

For each problem, find the volume of the solid that results when the region enclosed by the curves is revolved about the the y -axis. You may use the provided graph to sketch the curves and shade the enclosed region.

7) $x = \frac{1}{y}$, $x = 0$, $y = \frac{1}{6}$, $y = 6$

8) $x = 2\sqrt{y + 6}$, $x = 0$, $y = -1$, $y = 3$



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

9) $x = -y^2 + 4$, $x = 0$, $y = 0$, $y = 2$

10) $x = 2\sqrt{y + 4}$, $x = 0$, $y = 1$, $y = 2$

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.

11) $x = -y^2 + 6$, $x = 2$, $y = 0$, $y = 2$
Axis: $x = 2$

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

Answers to VOLUME OF A SOLID - DISK METHOD (ID: 1)

$$1) \pi \int_0^1 (\sqrt{x})^2 dx$$

$$= \frac{1}{2}\pi \approx 1.571$$

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

$$= \frac{376}{15}\pi \approx 78.749$$

$$3) \pi \int_{-2}^2 (-x^2 + 4)^2 dx$$

$$= \frac{512}{15}\pi \approx 107.233$$

$$4) \pi \int_1^6 \left(\frac{2}{x}\right)^2 dx$$

$$= \frac{10}{3}\pi \approx 10.472$$

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

$$= \frac{256}{15}\pi \approx 53.617$$

$$6) \pi \int_0^1 (x^2)^2 dx$$

$$= \frac{1}{5}\pi \approx 0.628$$

$$7) \pi \int_{\frac{1}{6}}^6 \left(\frac{1}{y}\right)^2 dy$$

$$= \frac{35}{6}\pi \approx 18.326$$

$$8) \pi \int_{-1}^3 (2\sqrt{y+6})^2 dy$$

$$= 112\pi \approx 351.858$$

$$9) \pi \int_0^2 (-y^2 + 4)^2 dy$$

$$= \frac{256}{15}\pi \approx 53.617$$

$$10) \pi \int_1^2 (2\sqrt{y+4})^2 dy$$

$$= 22\pi \approx 69.115$$

$$11) \pi \int_0^2 (-y^2 + 4)^2 dy$$

$$= \frac{256}{15}\pi \approx 53.617$$

$$12) \pi \int_{-1}^0 (-y^2 + 1)^2 dy$$

$$= \frac{8}{15}\pi \approx 1.676$$