VOLUMES BY SLICES 1

Draw a sketch of the figure. Use **calculus** to find the volume with the indicated base and slices. Show the integral used. All slices perpendicular to the base.

1. Base: $x^2+y^2=4$, rectangular slices where height is twice the base.

2. Base: a triangle formed by the line $y=\frac{1}{2}x$, the x-axis and x=5.
   Slices: semicircles

3. Base: enclosed area formed by $y=e^x$ on the interval [0,3], and y = 0.
   Slices are semicircles.

4. Base: rectangle formed by the line y=2 and y=0 on the interval [1,5]
   Slices: semicircles
   Use geometry to verify your calculus answer.

5. Base: $x^2+y^2=25$, semicircle slices

6. Base: enclosed area formed by $y=e^x$ on the interval [0,3], and y = 0.
   Slices are squares.

7. Base: a triangle formed by the line $y=2x-4$, the x-axis and y-axis. Slices: semicircles
8. Base: $x^2+y^2=4$. Slices: right triangle
9. Base bounded by $y=x^2+2$, x = 2, x = 0 and y = 0 with square slices.

Recall

Without a calculator find the enclosed area. Include a graph.

10. $f(x)=x^3-3x+2$
    $g(x)=x+2$

11. $f(x)=x^2-3x+5$
    $g(x)=-2x^2+9x-4$

With a calculator, find the enclosed area. Include a graph.

12. $f(x)=\sin x+\cos x$
    $g(x)=-x^3+3x^2+3x-3$

Ws 1 – volume by slices

1. $\frac{256}{3}$
2. $\frac{125\pi}{96}$
3. $\frac{\pi}{16}\left[e^6-1\right]$
4. 2π
5. $\frac{250\pi}{3}$
6. $\frac{1}{2}\left[e^6-1\right]$
7. $\frac{4\pi}{3}$
8. $\frac{64}{3}$
9. $\frac{376}{15}$
10. 8
11. 4
12. 19.888