For each solid, arc length, or surface area that follows **set up** the corresponding integral but **do not solve**.

1. Each integral represents the volume of a solid. Describe the solid.

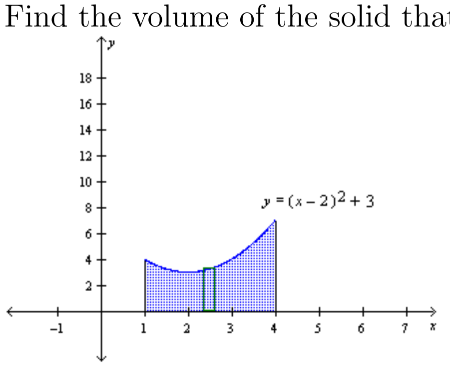
   (a) $\displaystyle\int_0^{\frac{\pi}{2}} \pi\cos^2 x dx$

   (b) $\displaystyle\int_0^{\frac{\pi}{2}} 2\pi x\cos x dx$

   (c) $\displaystyle\int_0^{\frac{\pi}{2}} \pi(2-\sin x)^2 dx$

   (d) $\displaystyle\int_0^{\frac{\pi}{2}} 4\pi - \pi\sin^2 x dx$

2. Find the volume of the solid that is obtained by revolving the region about the x-axis.



3. Find the volume of the solid generated by revolved the region bounded by the graphs of the equations about the indicated line. Sketch the region and a representative rectangle.
   $y = 25 - x^2$ and $y = 0$ about the line $x = -5$.

4. Set up the integral that will determine the length of the curve $y = \ln(1 - x^2)$ on $0 \leq x \leq \frac{1}{2}$.

5. A steady wind blows a kite due west. The kite's height above ground from horizontal position $x = 0$ to $x = 80$ is given by $y = 150 - \frac{1}{40}(x - 50)^2$. Find the distance traveled by the kite.

6. Set up the integral that will give the area of the surface obtained by rotating the curve $y = \tan x$ about the x-axis on the interval $0 \leq x \leq \frac{\pi}{3}$.

7. Set up the integral that will give the area of the surface obtained by rotating the curve $x = y + y^3$ about the x-axis on $0 \leq y \leq 1$.

8. Set up the integral that will give the area of the surface obtained by rotating the curve $x = y + y^3$ about the y-axis on $0 \leq y \leq 1$.

9. Set up the integral that will give the area of the surface obtained by rotating the curve $x = y + y^3$ about the x-axis on $0 \leq x \leq 1$.

10. Set up the integral that will give the area of the surface obtained by rotating the curve $x = y + y^3$ about the x-axis on $0 \leq y \leq 1$.

11. Set up the integral that will give the area of the surface obtained by rotating the curve $x = y + y^3$ about the y-axis on $0 \leq x \leq 1$.

12. Set up the integral that will give the area of the surface obtained by rotating the curve $x = y + y^3$ about the y-axis on $0 \leq y \leq 1$.