11.4 Perpendicular Cross Sections

Calculus Name: _____ **CA #2**

The base of an object is bounded by the lines $y = x^2 - 4$ and $y = 4 - 2x$. Find the volume of the object with the indicated cross sections taken perpendicular to the x-axis. Use a calculator after you set up the integral!

1. Squares

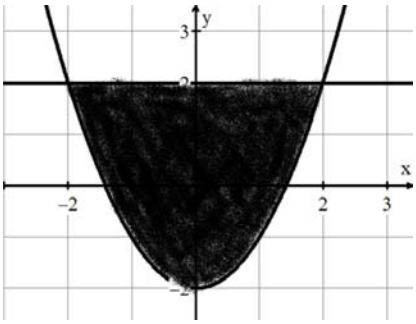
2. Equilateral triangles

3. Semi-circles

4. Isosceles right triangles (side is the base)

5. Set up the integral to find the area of the region bounded by $y = x^2 - 2$, and $y = 2$. DO NOT EVALUATE.

With respect to *x*.



With respect to *y*.

6. A solid is generated when the region in the first quadrant bounded by the graph of $y = 1 + \sin^2 x$, the line $x = \frac{\pi}{2}$, the x-axis, and the y-axis is revolved about the x-axis. What is the integral that represents the volume of the resulting solid of revolution?

Answers to 11.4 CA #2

1. $\int_{-4}^{2}(-x^2-2x+8)^2\,dx = 355.2$	2. $\frac{\sqrt{3}}{4}\int_{-4}^{2}(-x^2-2x+8)^2\,dx = 153.806$	3. $\frac{\pi}{8}\int_{-4}^{2}(-x^2-2x+8)^2\,dx = 139.487$
4. $\frac{1}{2}\int_{-4}^{2}(-x^2-2x+8)^2\,dx = 177.6$	5a. $\int_{-2}^{2}(4-x^2)\,dx$	
5b. $\int_{-2}^{2}\left(2\sqrt{y+2}\right)dy$	6. $\pi\int_{0}^{\frac{\pi}{2}}(1+\sin^2 x)^2\,dx$	