Calculus - Volumes w/ Cross-Sections

Key

1) $y = 3x^3 + 8,\ y = -x,\ x = 3 \perp$ x-axis

a) □ b) △EQ c) ⌓ Intersection $3x^3 + 8 = -x$, $x = -1.3066\ldots$ store in A

ⓐ $A_{\square} = s^2$ $V = \int_{-1.3066}^{3} [3x^3 + 8 - (-x)]^2\,dx =$

ⓑ $A_{EQ\triangle} = \frac{1}{2}bh = \frac{\sqrt{3}}{4}s^2$ $V = \int_{-1.3066}^{3} \frac{\sqrt{3}}{4}[3x^3 + 8 + x]^2\,dx =$

ⓒ $A_{\cap} = \frac{1}{2}\pi r^2 = \frac{1}{2}\pi\left(\frac{3x^3+8+x}{2}\right)^2$ $V = \int_{-1.3066}^{3} \frac{1}{2}\pi\left[\frac{3x^3+8+x}{2}\right]^2 =$

2) $y = x + 5,\ y = 7,$ y-axis, $\perp$ y-axis c.s. right isos. triangle

$A_{\triangle} = \frac{1}{2}bh = \frac{1}{2}s^2$ $V = \int_{5}^{7} \frac{1}{2}[y - 5 - 0]^2\,dy =$

intersect $x + 5 = 7$, $x = 2$

But wrt y $y = 7$

wrt y $y = x + 5$, $y - 5 = x$

3) $A_{\square} = bh,\ h = 3 \perp$ xaxis $y = \frac{1}{2}x + 4,\ x = 1,\ x = 6$

$V = \int_{1}^{6} \left(\frac{1}{2}x + 4 - 0\right)3\,dx =$

Calculus Name _____

Find the volumes using Cross-Sections

GRAPH the region, draw the reference rectangle, SHOW integral and then use calculator.

1. Find the volume of the solid created with the base of the region between $y = 3x^3 + 8$ and $y = -x$ and $x = 3$, and cross-sections perpendicular to the x-axis of a) square, b) equilateral triangle, c) semi circle.
2. Find the volume of the solid formed with the base of the region formed by $y = x + 5$, $y = 7$, and the y-axis, cross-sections perpendicular to the y-axis in the shape of a right triangle.
3. Find the volume of the solid formed by cross-sections of rectangle with height 3 perpendicular to the x-axis with the base region formed by the x-axis, $y = \frac{1}{2}x + 4$, x = 1 and x= 6.