11.2 Solids of Revolution (Discs)

Calculus   Name: _____

For each problem, sketch the area bounded by the equations and revolve it around the x-axis. Find the volume of the resulting solid formed by this revolution. Leave your answers in terms of π.

1. $y = 2x^2$, $x = 2$, $y = 0$

2. $y = 4 - x$, $x = 0$, $y = 0$

Same instructions as above but use a calculator and round to three decimals.

3. $y = x^3$, $y = 0$, $x = 3$

4. $y = \sqrt{4 - x^2}$, $y = 0$ in Quadrant I.

Same instructions as above but revolve around the y-axis now. Leave your answers in terms of π.

5. $y = 2x^2$, $x = 0$, $y = 2$

6. $y = 3 - \dfrac{1}{6}x$, $x = 0$, $y = 0$

Find the volume by revolving the area about the given line. Set up the integral, then use a calculator to evaluate. Remember 3 DECIMALS in AP Calculus!!

7. $y = \sqrt{x}$, $x = 0$, $x = 9$, $y = -2$ about the line $y = -2$.

8. $y = 2x^2$, $x = 2$, $y = 0$ about the line $x = 2$.

Answers to 11.2 CA #2

1. $\pi \int_0^2 (4x^4)\, dx = \frac{128}{5}\pi$	2. $\pi \int_0^4 (4 - x)^2\, dx = \frac{64}{3}\pi$	3. $\pi \int_0^3 x^6\, dx = 981.523$
4. $\pi \int_0^2 (4 - x^2)\, dx = 16.755$	5. $\pi \int_0^2 \left(\frac{y}{2}\right) dy = \pi$	6. $\pi \int_0^3 (18 - 6y)^2\, dy = 324\pi$
7. $\pi \int_0^9 \left(\sqrt{x} + 2\right)^2 dx = 466.527$	8. $\pi \int_0^8 \left(2 - \sqrt{\frac{y}{2}}\right)^2 dy = 16.755$	