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1.
Find the average value of the function on the given interval. Reduce your answer to lowest terms.

$g(x) = x^2\sqrt{64 + x^3}$, [0, 8]

2.
The region bounded by the curve

$y = 4, \quad y = x^2 - 5x + 8$

is rotated about the axis $x = -3$. Find the volume of the resulting solid by any method.

3.
Set up, but do not evaluate, an integral for the volume of the solid obtained by rotating the region bounded by the curve

$x = \sqrt{\sin y}$, $0 \le y \le \pi$, $x = 0$;

about the axis $y = 5$.

a. $V = \int_0^{\pi} \pi(5 - y)\sqrt{\sin y}\, dy$

b. $V = \int_0^{\pi} 2\pi(5 + y)\sqrt{\sin y}\, dy$

c. $V = \int_0^{\pi} 2\pi(y - 5)\sqrt{\sin y}\, dy$

d. $V = \int_0^{\pi} 2\pi(5 - y)\sqrt{\sin y}\, dy$

e. $V = \int_0^{\pi} 2\pi\sqrt{(5 + y)}\sqrt{\sin y}\, dy$

4.
Use the method of cylindrical shells to find the volume of the solid obtained by rotating the region bounded by the curves

$x = 6y^2 - y^3$, $x = 0$

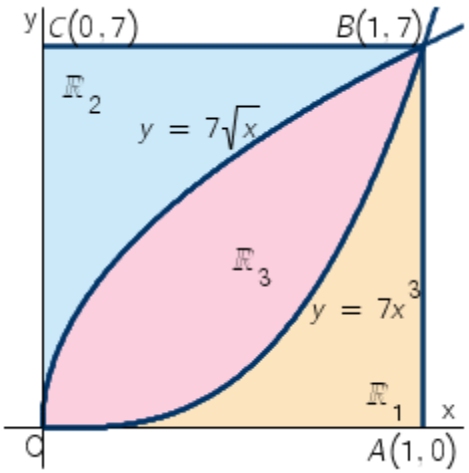
about the *x*-axis.

5.
Find the values of *c* such that the area of the region bounded by the parabolas $y = x^2 - c^2$ and $y = c^2 - x^2$ is 1944.

_____

6.

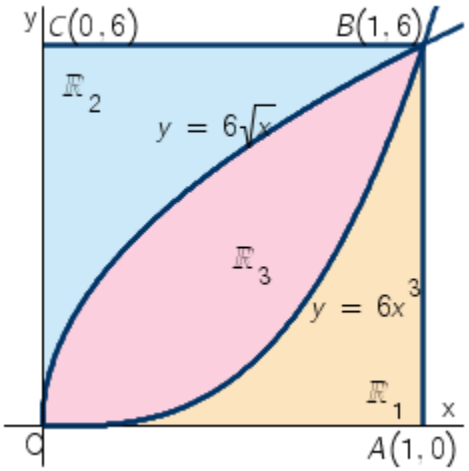
Refer to the figure and find the volume generated by rotating the R_1 about BC.



Enter your answer as an expression using the symbol π or as a decimal rounded to the nearest hundredth.

7.

Refer to the figure and find the volume generated by rotating the given region about the specified line.



R_2 about OC.

Enter your answer as an expression using the symbol π or as a decimal rounded to the nearest hundredths.

8.

Find the average value of *f* on the given interval.

$f(x) = 3\sin x - \sin 4x, \quad [0, \pi]$

9.

Find all number(s) *b* such that the average value of $f(x) = 5 + 14x - 3x^2$ on the interval [0, *b*] is equal to 8.

10.

Find the area of the region bounded by the curves $y = 9 \sin 9x$, $y = 9e^{9x}$, $x = 0$, and $x = \frac{\pi}{18}$.

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ANSWER KEY

HW #1

1 $\frac{3328}{9}$

2 $\frac{99\pi}{2}$

3 d

4 $\frac{3888\pi}{5}$

5 $9, -9$

6 $\frac{35\pi}{2}$

7 $\frac{6\pi}{5}$

8 $\frac{6}{\pi}$

9 $\frac{7 \pm \sqrt{37}}{2}$

10 $e^{\frac{\pi}{2}} - 2$