

2 - AREA BETWEEN CURVES, VOLUMES WITH KNOWN CROSS SECTIONS

Sketch the region, write the associated integral, find the area between the functions. Use a calculator to integrate on the * items.

1. between $y = x^2$ and $y = x^3$.
2. between $y = x + 3$ and $y = x^2 - 2x + 3$.
3. between $y = x$ and $y = \sqrt{x}$.
4. * area enclosed by $y = -2\sin(x-3)$ and $y = \ln(x+2)$.
5. enclosed by $y = 2x + 2$ and $y = x^3 - x^2 + 2$.
6. * area between $f(x) = x^3 - 2x^2 - 2x + 3$ and $g(x) = 5\cos(2x-2)$.

Find the indicated volumes. No Calculator necessary!

7. Find the volume of the solid that is bounded by the circle $x^2 + y^2 = 9$ with the indicated cross sections taken perpendicular to the x-axis. Sketch each.
 - a. Squares
 - b. Equilateral triangles
 - c. Semicircles
 - d. Isosceles right triangles
8. Find the volume of the solid that is bounded by $y = x^3$, $y = 0$ and $x = 1$ with the indicated cross sections taken perpendicular to the x-axis.
 - a. Squares
 - b. Rectangles whose height is twice their base
 - c. Semicircles
 - d. Rectangles of height 2
9. Find the volume of the solid that is bounded by $y = x$, $y = -x$ and $x = 2$ with the indicated cross sections taken perpendicular to the x-axis.
 - a. Squares
 - b. Isosceles right triangles
 - c. Equilateral triangles
 - d. Rectangles of height 3

Answers

1. $1/12$
2. $9/2$
3. $1/6$
4. 3.123
5. $37/12$
6. 14.233
7. -
 - a. 144
 - b. $36\sqrt{3}$
 - c. 18π
 - d. 72
8. -
 - a. $1/7$
 - b. $2/7$
 - c. $\pi/56$
 - d. $1/2$
9. -
 - a. $32/3$
 - b. $16/3$
 - c. $8\sqrt{3}/3$
 - d. 12