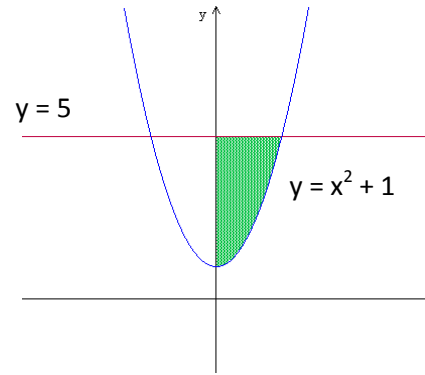


AP Questions Chapter 7

1) For the figure to the right, the area of the shaded region is

- (A) $14/3$ (B) $16/3$ (C) $28/3$
(D) $32/3$ (E) $65/3$



2) If, for all real numbers x , $f(x) = g(x) + 5$, then on any interval $[a, b]$ the area of the region between the graphs of $f(x)$ and $g(x)$ is

- (A) 5 (B) $5a + 5b$ (C) $5b - 5a$ (D) $5a - 5b$ (E) $5ab$

3) The region in the first quadrant enclosed by the graphs $y = x$ and $y = 2\sin x$ is revolved about the x-axis. The volume of the solid generated is

- (A) 1.895
(B) 2.126
(C) 5.811
(D) 6.678
(E) 13.355

4) The area of the region between the graph of $y = 3x^2 + 2x$ and the x-axis from $x = 1$ to $x = 3$ is

- (A) 36 (B) 34 (C) 31 (D) 26 (E) 12

5) The base of a solid is the region in the first quadrant bounded by the line $x + 2y = 4$ and the coordinate axes. What is the volume of the solid if every cross section perpendicular to the x -axis is a semicircle?

(A) $\frac{2\pi}{3}$

(B) $\frac{4\pi}{3}$

(C) $\frac{8\pi}{3}$

(D) $\frac{32\pi}{3}$

(E) $\frac{64\pi}{3}$

6) The region in the first quadrant enclosed by the x -axis, the line $x = \pi$, and the curve $y = \cos(\cos(x))$ is rotated about the x -axis. What is the volume of the solid generated?

(A) 1.921

(B) 3.782

(C) 6.040

(D) 8.130

(E) 23.781

7) The region bounded by the x -axis and the part of the graph of $y = \cos x$ between $x = 0$ and $x = \pi/2$ is divided into two regions by the line $x = c$. If the area of the region for $0 \leq x \leq c$ is equal to the area of the region for $c \leq x \leq \pi/2$, the c must be

(A) $\frac{\pi}{4}$

(B) $\frac{\pi}{6}$

(C) $\frac{\pi}{3}$

(D) $\frac{2\pi}{9}$

(E) $\frac{5\pi}{18}$

8) The region enclosed by the line $x + y = 1$ and the coordinate axes is rotated about the line $y = -1$. What is the volume of the solid generated?

(A) $\frac{17\pi}{2}$

(B) $\frac{12\pi}{4}$

(C) $\frac{2\pi}{3}$

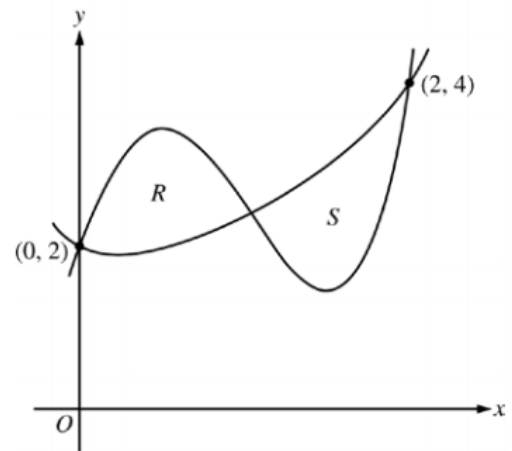
(D) $\frac{3\pi}{4}$

(E) $\frac{4\pi}{3}$

9) 2015 Question #2 Calculator

Let f and g be the functions defined by $f(x) = 1 + x + e^{x^2 - 2x}$ and $g(x) = x^4 - 6.5x^2 + 6x + 2$. Let R and S be the two regions enclosed by the graphs of f and g shown in the figure above.

- (a) Find the sum of the areas of regions R and S .
- (b) Region S is the base of a solid whose cross sections perpendicular to the x -axis are squares. Find the volume of the solid.
- (c) Let h be the vertical distance between the graphs of f and g in region S . Find the rate at which h changes with respect to x when $x = 1.8$.



10) 2014 Question #2 Calculator

Let R be the region enclosed by the graph of $f(x) = x^4 - 2.3x^3 + 4$ and the horizontal line $y = 4$, as shown in the figure above.

- (a) Find the volume of the solid generated when R is rotated about the horizontal line $y = -2$.
- (b) Region R is the base of a solid. For this solid, each cross section perpendicular to the x -axis is an isosceles right triangle with a leg in R . Find the volume of the solid.
- (c) The vertical line $x = k$ divides R into two regions with equal areas. Write, but do not solve, an equation involving integral expressions whose solution gives the value k .

