

AppOfInt Practice MC Test

Name _____

1. What is the average value of $y = \frac{\cos x}{x^2 + x + 2}$ on the closed interval $[-1, 3]$?

(A) -0.085

(B) 0.090

(C) 0.183

(D) 0.244

(E) 0.732

2. Water is pumped into a tank at a rate of $r(t) = 30(1 - e^{-0.16t})$ gallons per minute, where t is the number of minutes since the pump was turned on. If the tank contained 800 gallons of water when the pump was turned on, how much water, to the nearest gallon, is in the tank after 20 minutes?

(A) 380 gallons

(B) 420 gallons

(C) 829 gallons

(D) 1220 gallons

(E) 1376 gallons

3. Let R be the region enclosed by the graph of $y = 1 + \ln(\cos^4 x)$, the x -axis, and the lines $x = -2/3$ and $x = 2/3$. The closest integer approximation of the area of R is



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(A) 0

(B) 1

(C) 2

(D) 3

(E) 4

4. What is the area enclosed by the curves $y = x^3 - 8x^2 + 18x - 5$ and $y = x + 5$?

(A) 10.667

(B) 11.833

(C) 14.583

(D) 21.333

(E) 32

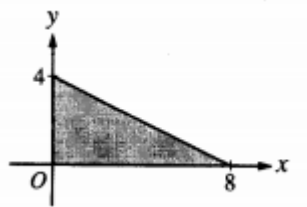
5. The base of a solid is the region in the first quadrant bounded by the y -axis, the graph of $y = \tan^{-1} x$, the horizontal line $y = 3$ and the vertical line $x = 1$. For this solid, each cross section perpendicular to the x -axis is a square. What is the volume of the solid?



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- (A) 2.561
- (B) 6.612
- (C) 8.046
- (D) 8.755
- (E) 20.773
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6.



The base of a solid is a region in the first quadrant bounded by the x -axis, the y -axis, and the line $x+2y=8$, as shown in the figure above. If cross sections of the solid perpendicular to the x -axis are semicircles, what is the volume of the solid?

- (A) 12.566
- (B) 14.661
- (C) 16.755
- (D) 67.021
- (E) 134.041
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7. What is the volume of the solid generated by rotating about the x -axis the region enclosed by the curve $y = \sec x$ and the lines $x=0$, $y=0$, and $x = \frac{\pi}{3}$?

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

(B) π

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

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

(E) $\pi \ln\left(\frac{1}{2} + \sqrt{3}\right)$

8. Let S be the region enclosed by the graphs of $y = 2x$ and $y = 2x^2$ for $0 \leq x \leq 1$. What is the volume of the solid generated when S is revolved about the line $y = 3$?

(A) $\pi \int_0^1 ((3 - 2x^2)^2 - (3 - 2x)^2) dx$

(B) $\pi \int_0^1 ((3 - 2x)^2 - (3 - 2x^2)^2) dx$

(C) $\pi \int_0^1 (4x^2 - 4x^4) dx$

(D) $\pi \int_0^2 \left(\left(3 - \frac{y}{2}\right)^2 - \left(3 - \sqrt{\frac{y}{2}}\right)^2 \right) dy$

(E) $\pi \int_0^2 \left(\left(3 - \sqrt{\frac{y}{2}}\right)^2 - \left(3 - \frac{y}{2}\right)^2 \right) dy$
