

SELECT THE CORRECT ANSWER ON YOUR SCAN TRON ANSWER SHEET

1. Find the area of the region bounded by the graphs of

$$f(x) = x^3 + 4x^2 - 12x \text{ and } g(x) = -x^2 + 2x.$$

a. $\frac{3773}{6}$

b. None of these

c. $\frac{1215}{4}$

d. $\frac{3901}{12}$

e. $\frac{32}{3}$

2. Find the volume of the solid formed by revolving the region bounded by the graphs of
- $y = -x^2 + 1$
- and
- $y = 0$
- about the
- x
- axis.

a. None of these

b. $\frac{16\pi}{15}$

c. $\frac{2\pi}{3}$

d. $\frac{4\pi}{3}$

e. $\frac{8\pi}{15}$

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3. Find the volume of the solid formed by revolving the region bounded by $y = x^3$, $x = 2$, and $y = 1$ about the y -axis.
- $\frac{93}{5}\pi$
 - None of these
 - $\frac{62}{5}\pi$
 - $\frac{120}{7}\pi$
 - $\frac{47}{5}\pi$
4. Which of the following integrals represents the volume of the solid formed by revolving the region bounded by $y = x^3$, $y = 1$, and $x = 2$ about the line $y = 10$?
- $2\pi \int_1^8 y(2 - \sqrt[3]{y}) dy$
 - $\pi \int_1^2 [81 - (10 - x^3)^2] dx$
 - $\pi \int_1^2 [1 - (10 - x^3)^2] dx$
 - None of these
 - $\pi \int_1^8 (10 - y)(2 - \sqrt[3]{y}) dy$
5. Use the integration capabilities of a graphing utility to approximate the volume of the solid formed by revolving the region bounded by $y = e^x$, $y = 0$, $x = 0$ and $x = 1$ about the y -axis. Round your answer to three decimal places.
- 1.359
 - 6.283
 - None of these
 - 8.540
 - 9.870

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6.

Find the arc length of the graph of $f(x) = \frac{2}{3}(x - 2)^{3/2}$ on the interval $[2, 4]$.

- a. None of these
 b. 2
 $-\left[\frac{2}{3}(3)^{3/2} - 1\right]$
 3
 c. 2
 $-\frac{2}{3}(2)^{3/2}$
 3
 d. 2
 $6 + \frac{2}{3}(2)^{3/2}$
 3
 e. 6

7. Identify the definite integral that represents the area of the surface formed by revolving the graph of $f(x) = 25 - x^2$ on the interval $[0, 25]$ about the y -axis.

- a. $2\pi \int_0^{25} (25 - x^2)\sqrt{1 + 4x^2} dx$
 b. $2\pi \int_0^{25} x\sqrt{1 + 4x^2} dx$
 c. $2\pi \int_0^{25} \sqrt{1 + 4x^2} dx$
 d. None of these

8. A force of 650 pounds compresses a spring 5 inches from its natural length. Find the work done in compressing the spring 2 additional inches. [Units are in inch-pounds.]

- a. 1560
 b. 3185
 c. 260
 d. 910
 e. None of these

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9. Find the centroid of the region bounded by the graphs of

$$f(x) = 36 - x^2 \text{ and } g(x) = \frac{36 - x^2}{4}.$$

- a. $\left[\begin{array}{c} 27 \\ 0, \frac{\quad}{4} \end{array} \right]$
- b. None of these
- c. $\left[\begin{array}{c} 45 \\ 0, \frac{\quad}{2} \end{array} \right]$
- d. $(0, 18)$
- e. $\left[\begin{array}{c} 27 \\ \frac{\quad}{4}, 0 \end{array} \right]$

10. A metal tank has a square bottom 5 feet wide and rectangular walls 7 feet high. Find the fluid force on one of the walls when the tank is full of ethyl alcohol. [Ethyl alcohol is 49.4 pounds per cubic foot.]
- a. 7644.0 lb
- b. 15 288.0 lb
- c. None of these
- d. 6051.5 lb
- e. 12 103.0 lb