

# Calculus Web Assignments

Web Assignments are intended to be completed with a partner. Both partners should individually work each of the problems, followed by a collaborative discussion about the problem.

Both partners are required to participate in the “Honor-System” Grading of the Web Assignment.

## Calculus: Web Assignment #15

### Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. What is  $f(x)$  if  $f'(x) = \frac{2x}{x^2 - 1}$  and  $f(2) = 0$ ?
  - a.  $f(x) = \ln|x^2 - 1|$
  - b.  $f(x) = \ln|x^2 - 1| - \ln 3$
  - c.  $f(x) = \ln|x^2 - 1| + \ln 3$
  - d.  $f(x) = 2 \ln x - x^2$
  - e.  $f(x) = 2 \ln x - x^2 - 2 \ln 2 + 4$
2. What is the average value of the function  $f(x) = 2e^{\frac{x}{4}}$  on the interval  $[0, 4]$ ?
  - a.  $2(e - 1)$
  - b.  $2e$
  - c.  $2 \ln 4$
  - d.  $e^2 - 1$
  - e.  $e + 2$

3. Approximate the area under the curve  $y = \sin x$  from 0 to  $\frac{\pi}{2}$  using ten approximating rectangles of equal widths and right endpoints.

Select the correct answer. The choices are rounded to the nearest hundredth.

- a. 0.72
  - b. 0.98
  - c. 0.02
  - d. 1.08
  - e. 0.36
4. How many points of inflection are on the graph of the function?

$$f(x) = 12x^3 + 14x^2 - 7x - 9$$

Select the correct answer.

- a. 3
  - b. 1
  - c. 4
  - d. 2
  - e. 5
5. Find the number  $c$  that satisfies the conclusion of the Mean Value Theorem on the given interval.

$$f(x) = 2\sqrt{x}, \quad [0, 9]$$

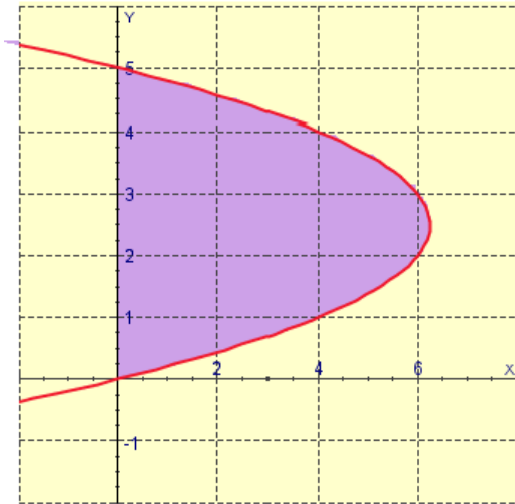
Select the correct answer.

- a.  $c = 9/4$
- b.  $c = 0$
- c.  $c = 1/4$
- d.  $c = 5$
- e. none of these

6. The area of the region that lies to the right of the  $y$ -axis and to the left of the parabola

$x = 5y - y^2$  (the shaded region in the figure) is given by the integral  $\int_0^5 (5y - y^2) dy$ .

Find the area.



Select the correct answer.

- a. 125
- b.  $\frac{25}{6}$
- c. 6.25
- d.  $\frac{125}{6}$
- e. 45.6

7. Find the absolute maximum value of  $y = \sqrt{36 - x^2}$  on the interval  $[-6, 6]$ .

Select the correct answer.

- a. 5
- b. 6
- c. 7
- d. 0
- e. 1

8. For what value of the constant  $c$  is the function  $f$  continuous on  $(-\infty, \infty)$ ?

$$f(x) = \begin{cases} cx + 7 & \text{for } x \leq 2 \\ cx^2 - 5 & \text{for } x > 2 \end{cases}$$

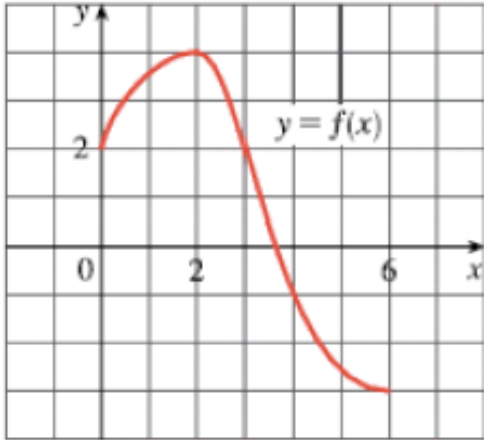
- a.  $c = 1$
- b.  $c = 2$
- c.  $c = 6$
- d.  $c = -2$
- e.  $c = 7$

9. Use the graph of the function to state the value of  $\lim_{x \rightarrow 0} f(x)$ , if it exists.

$$f(x) = \frac{x^2 + x}{\sqrt[3]{x^3 + x^2}}$$

- a. 0
- b.  $\frac{1}{3}$
- c.  $-\frac{1}{3}$
- d.  $\infty$
- e. does not exist

10. Use the given graph of  $f$  to find the Riemann sum with six subintervals. Take the sample points to be midpoints.



Select the correct answer.

- a. 5.7
- b. 8
- c. 3.7
- d. 2.5
- e. 4.5