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 #3

Multiple Choice

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

____ 1. Find: $\lim_{x \to \frac{\pi}{2}} \frac{\sin x}{x}$ if it exists.

a. 0
b. 1
c. $\frac{2}{\pi}$
d. $\frac{\pi}{2}$
e. DNE

____ 2. Given: $f(x) = \begin{cases} x^2 + 1 & x < 2 \\ 4 & x > 2 \end{cases}$ Find: $\lim_{x \to 2^-} f(x)$

a. 0
b. 2
c. 4
d. 5
e. DNE

____ 3. The graph of the derivative of $f(x) = x^2$ is

a. a horizontal line
b. a vertical line
c. a line with a positive slope
d. a line with a negative slope
e. a line with a y-intercept of 2

____ 4. Find: $\lim_{x \to \frac{\pi}{3}} \frac{1 - \cos x}{x}$ if it exists.

a. $\frac{\pi}{3}$

b. $\frac{3}{\pi}$

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

d. $\frac{3(1 - \sqrt{3})}{2\pi}$

e. 0

____ 5.

x	1	2	3	4
$f(x)$	4	2	3	1
$g(x)$	2	3	1	4

Selected values for continuous functions $f(x)$ and $g(x)$ are given in the table above.

Find: $\lim_{x \to 3} \frac{f(g(x))}{g(f(x))}$

a. $\frac{1}{4}$

b. $\frac{1}{3}$

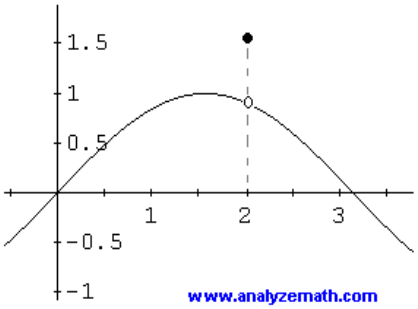
c. 1

d. 3

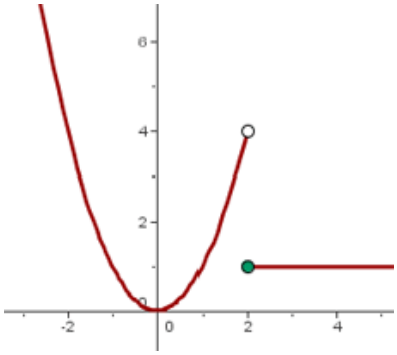
e. 4

____ 6. Which of the following graphs shows a function that is continuous for all real numbers?

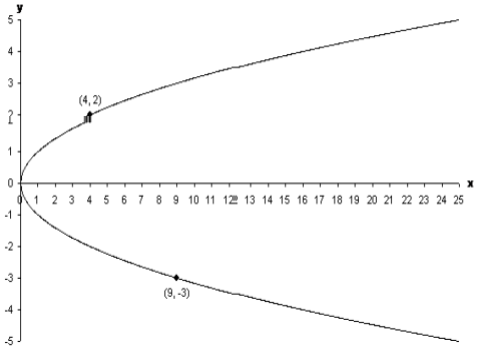
a.



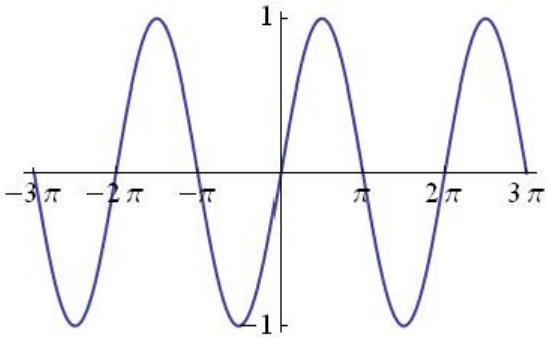
b.



c.



d.



____ 7. Find: $\lim_{x \to 3} \dfrac{\dfrac{1}{x} - \dfrac{1}{3}}{x - 3}$ if it exists.

a. $-\infty$

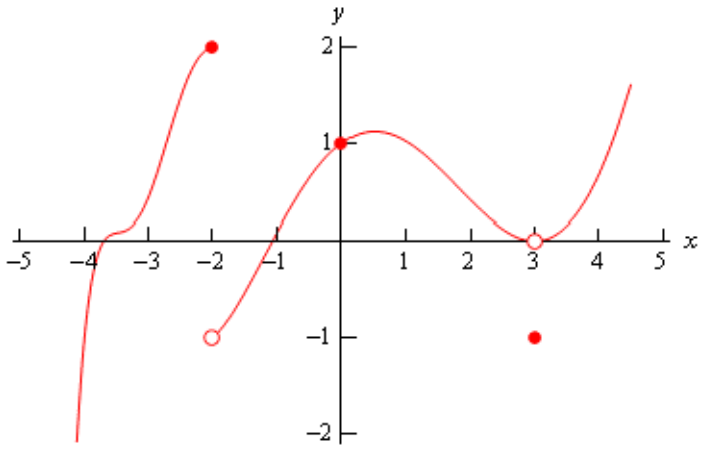
b. $-\dfrac{1}{3}$

c. $-\dfrac{1}{9}$

d. 0

e. $\dfrac{1}{3}$

____ 8. Which of the following statements is true about the figure?



a. $\lim_{x \to 3} f(x)$ exists

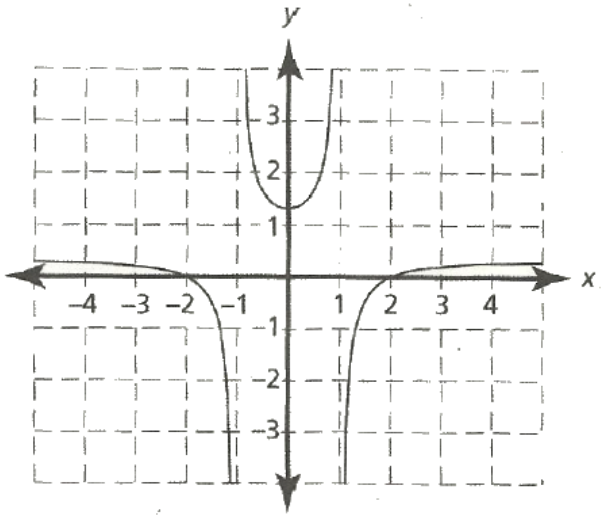
b. $\lim_{x \to -2} f(x)$ exists

c. $\lim_{x \to 3} f(x) = f(3)$

d. $\lim_{x \to -2} f(x) = f(-2)$

e. $\dfrac{f(3) - f(-2)}{3 - (-2)} = f'(c)$

____ 9.

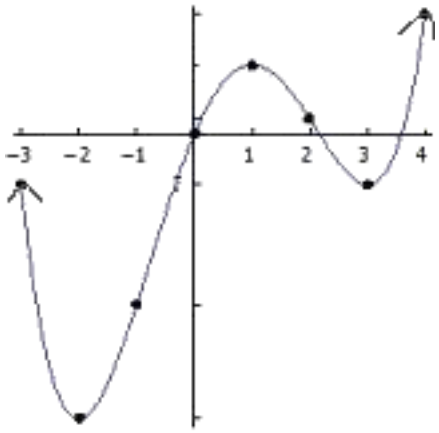


The function $g(x)$ is shown in the graph above and is of the form $g(x) = \dfrac{x^2 + a}{bx^2 - 3}$.

Which of the following could be the values of the constants a and b ?

a. $a = -2, b = -1$
b. $a = -2, b = -3$
c. $a = -4, b = 3$
d. $a = -4, b = -3$
e. $a = 4, b = 3$

____ 10. Consider the following function $f(x)$:



On what interval(s) is the slope of the tangent of the graph of $f(x)$ positive?

a. $(-2, 1) \cup (3, \infty)$

b. $(-2, 1)$

c. $(-\infty, -2) \cup (1, 3)$

d. $(3, \infty)$

e. $(-\infty, 1)$