Non-Algebra Calculus MC ☺

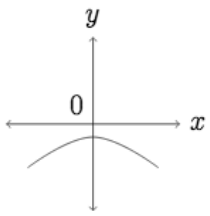
7) The derivative g' of a function g is continuous and has exactly two zeros. Selected values of g' are given in the table below. If the domain of g is $\mathbb{R}$, then g is decreasing on which of the following intervals?

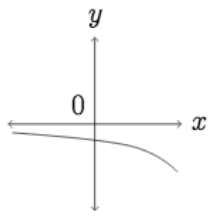
x	-4	-3	-2	-1	0	1	2	3	4
$g'(x)$	2	3	0	-3	-2	-1	0	3	2

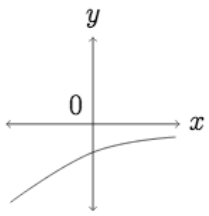
A) $-2 < x < 2$ only B) $-1 < x < 1$ only C) $x > -2$ D) $x > 2$ only

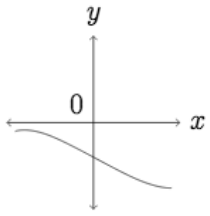
E) $x - 2$ or $x > 2$

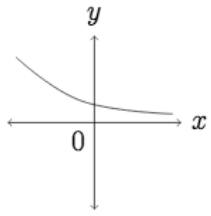
8) The function f has the property that $f(x)$, $f'(x)$ and $f''(x)$ are negative for all real values x. Which of the following could be the graph of f?

A) 

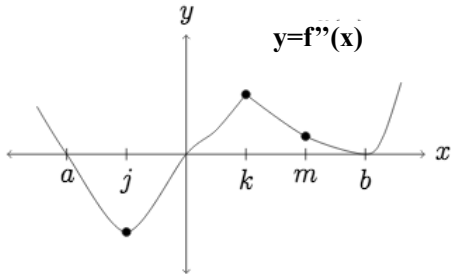
B) 

C) 

D) 

E) 

9) The second derivative of the function f is given by $f''(x) = x(x-a)(x-b)^2$. The graph of f'' is shown below. For what values of x does the graph of f have a point of inflection?



A) 0 and a only B) 0 and m only C) b and j only D) 0, a ,and b

E) b, j, and k

10) For all x in the closed interval $[2, 5]$, the function f has positive first derivatives and a negative second derivative. Which of the following could be a table of values for f ?

A)

x	$f(x)$
2	7
3	9
4	12
5	16

B)

x	$f(x)$
2	7
3	11
4	14
5	16

C)

x	$f(x)$
2	16
3	12
4	9
5	7

D)

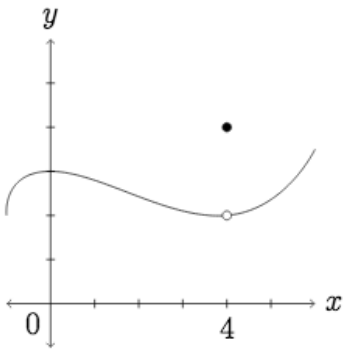
x	$f(x)$
2	16
3	14
4	11
5	7

E)

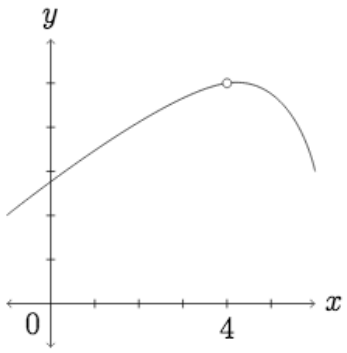
x	$f(x)$
2	16
3	13
4	10
5	7

11) For which of the following does $\lim_{x \to 4} f(x)$ exist?

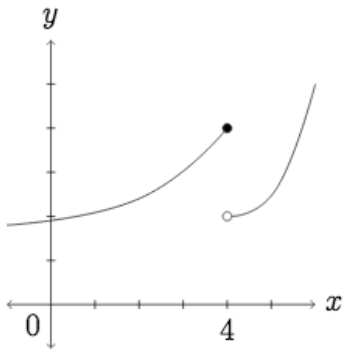
I.



II.

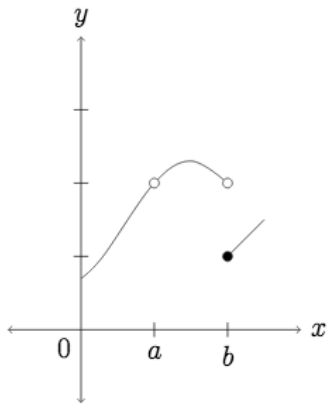


III.



A) I only B) II only C) III only D) I and II only E) I and III only

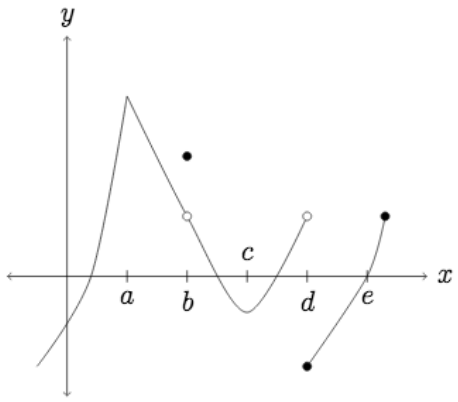
12) The graph of the function f is shown in the figure below. Which of the following statements about f is true?



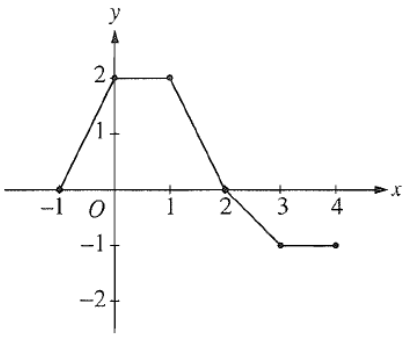
A) $\lim_{x\to a} f(x) = \lim_{x\to b} f(x)$ B) $\lim_{x\to a} f(x) = 2$ C) $\lim_{x\to b} f(x) = 2$

D) $\lim_{x\to b} f(x) = 1$ E) $\lim_{x\to a} f(x)$ does not exist.

15) The graph of a function f is shown below. At which value of x is f continuous, but not differentiable?



A) a B) b C) c D) d E) e



2. The graph of a piecewise-linear function f, for $-1 \le x \le 4$, is shown above. What is the value of $\int_{-1}^{4} f(x)\,dx$?

(A) 1 (B) 2.5 (C) 4 (D) 5.5 (E) 8

4. If f is continuous for $a \le x \le b$ and differentiable for $a < x < b$, which of the following could be false?

(A) $f'(c) = \dfrac{f(b) - f(a)}{b - a}$ for some c such that $a < c < b$.

(B) $f'(c) = 0$ for some c such that $a < c < b$.

(C) f has a minimum value on $a \le x \le b$.

(D) f has a maximum value on $a \le x \le b$.

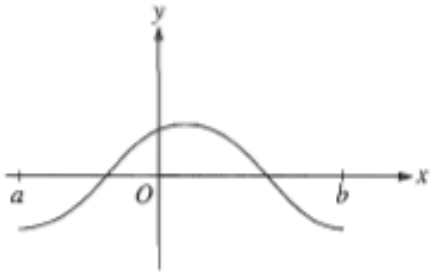
(E) $\int_{a}^{b} f(x)\,dx$ exists.

14. A particle moves along the x-axis so that its position at time t is given by $x(t) = t^2 - 6t + 5$. For what value of t is the velocity of the particle zero?

(A) 1 (B) 2 (C) 3 (D) 4 (E) 5

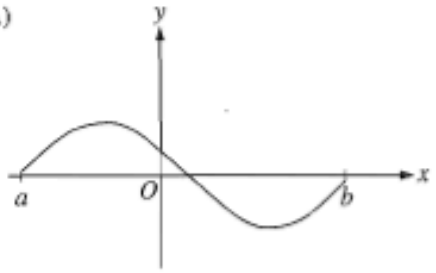
18. An equation of the line tangent to the graph of $y = x + \cos x$ at the point (0, 1) is

(A) $y = 2x + 1$ (B) $y = x + 1$ (C) $y = x$ (D) $y = x - 1$ (E) $y = 0$

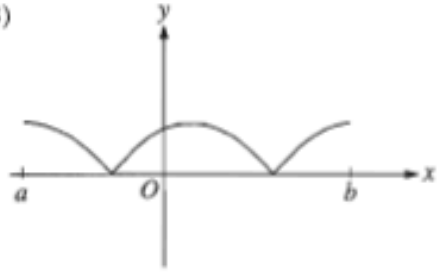


23. The graph of f is shown in the figure above. Which of the following could be the graph of the derivative of f?

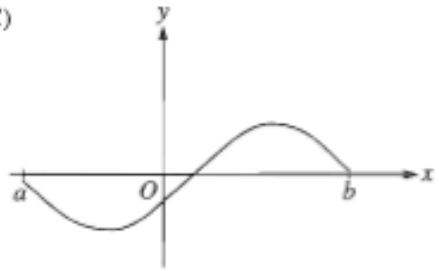
(A)



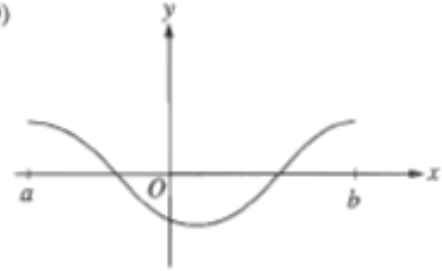
(B)



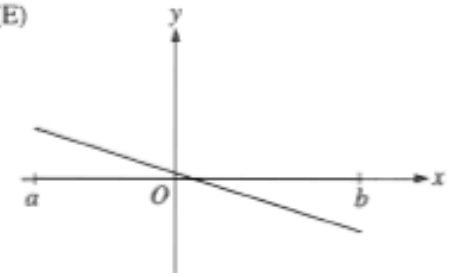
(C)

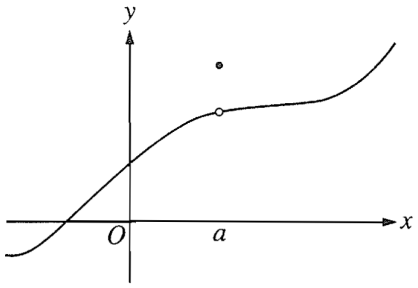


(D)



(E)





76. The graph of a function f is shown above. Which of the following statements about f is false?

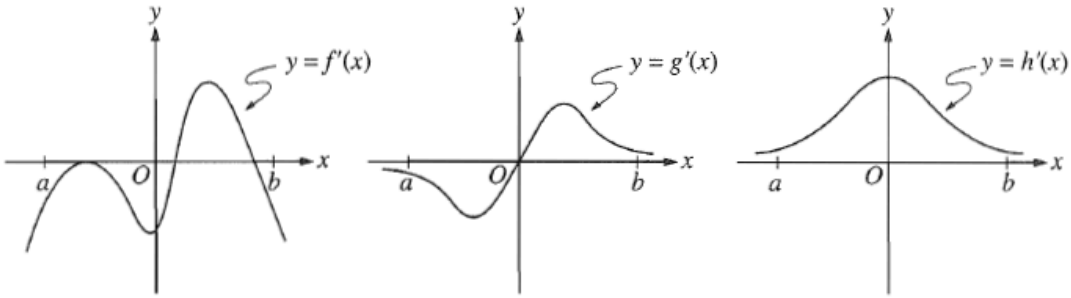
(A) f is continuous at $x = a$.

(B) f has a relative maximum at $x = a$.

(C) $x = a$ is in the domain of f.

(D) $\lim_{x \to a^+} f(x)$ is equal to $\lim_{x \to a^-} f(x)$.

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



79. The graphs of the derivatives of the functions f, g, and h are shown above. Which of the functions f, g, or h have a relative maximum on the open interval $a < x < b$?

(A) f only
(B) g only
(C) h only
(D) f and g only
(E) f, g, and h

81. Let f be the function given by $f(x) = |x|$. Which of the following statements about f are true?

I. f is continuous at $x = 0$.
II. f is differentiable at $x = 0$.
III. f has an absolute minimum at $x = 0$.

(A) I only (B) II only (C) III only (D) I and III only (E) II and III only