

AB Calculus

Analyzing f , f' , f'' MC practice

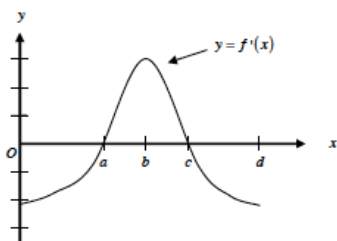
1)

x	0	1	2	3
$f''(x)$	5	0	-7	4

The polynomial function f has selected values of its second derivative f'' given in the table above. Which of the following statements must be true?

- (A) f is increasing on the interval $(0, 2)$.
- (B) f is decreasing on the interval $(0, 2)$.
- (C) f has a local maximum at $x = 1$.
- (D) The graph of f has a point of inflection at $x = 1$.
- (E) The graph of f changes concavity in the interval $(0, 2)$.

2)



76. The graph of f' , the derivative of a function f , is shown above. The domain of f is the open interval $0 < x < d$. Which of the following statements is true?

- (A) f has a local minimum at $x = c$.
- (B) f has a local maximum at $x = b$.
- (C) The graph of f has a point of inflection at $(a, f(a))$.
- (D) The graph of f has a point of inflection at $(b, f(b))$.
- (E) The graph of f is concave up on the open interval (c, d) .

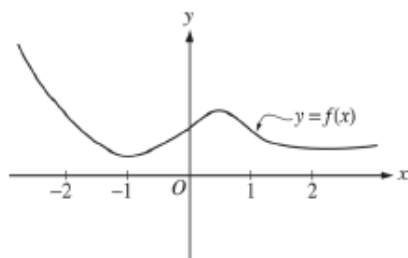
3)

x	$f(x)$
1	2.4
3	3.6
5	5.4

80. The table above gives selected values of a function f . The function is twice differentiable with $f''(x) > 0$. Which of the following could be the value of $f'(3)$?

- (A) 0.6
- (B) 0.7
- (C) 0.9
- (D) 1.2
- (E) 1.5

4)



88. The graph of a twice-differentiable function f is shown in the figure above. Which of the following is true?

- (A) $f'(-1) < f'(1) < f'(0)$
- (B) $f'(-1) < f'(0) < f'(1)$
- (C) $f'(0) < f'(-1) < f'(1)$
- (D) $f'(1) < f'(-1) < f'(0)$
- (E) $f'(1) < f'(0) < f'(-1)$

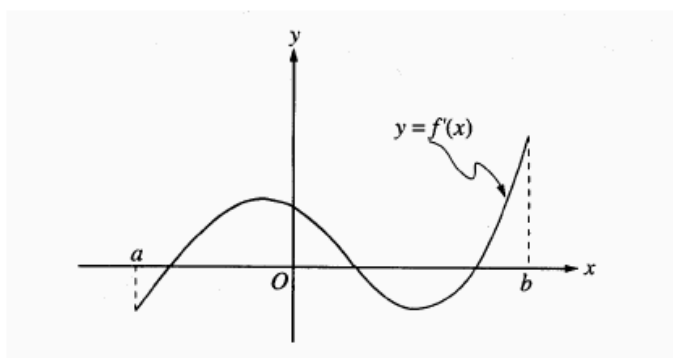
5)

	$0 < x < 1$	$1 < x < 2$
$f(x)$	Positive	Negative
$f'(x)$	Negative	Negative
$f''(x)$	Negative	Positive

81. Let f be a function that is twice differentiable on $-2 < x < 2$ and satisfies the conditions in the table above. If $f(x) = f(-x)$, what are the x -coordinates of the points of inflection of the graph of f on $-2 < x < 2$?

- (A) $x = 0$ only
- (B) $x = 1$ only
- (C) $x = 0$ and $x = 1$
- (D) $x = -1$ and $x = 1$
- (E) There are no points of inflection on $-2 < x < 2$.

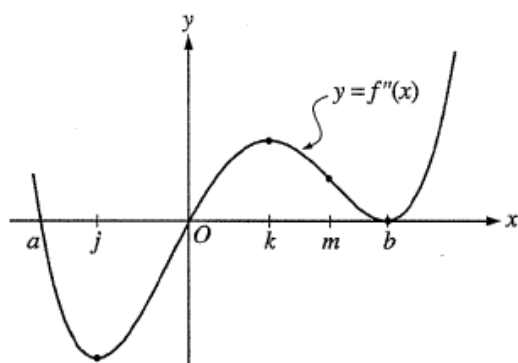
6)



The graph of f' , the derivative of f , is shown in the figure above. Which of the following describes all relative extrema of f on the open interval (a, b) ?

- (A) One relative maximum and two relative minima
- (B) Two relative maxima and one relative minimum
- (C) Three relative maxima and one relative minimum
- (D) One relative maximum and three relative minima
- (E) Three relative maxima and two relative minima

7)



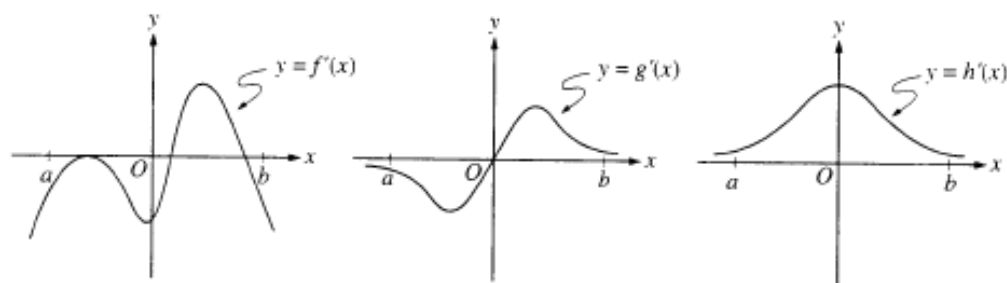
21. The second derivative of the function f is given by $f''(x) = x(x - a)(x - b)^2$. The graph of f'' is shown above. For what values of x does the graph of f have a point of inflection?
- (A) 0 and a only (B) 0 and m only (C) b and j only (D) 0, a , and b (E) b , j , and k

8)

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

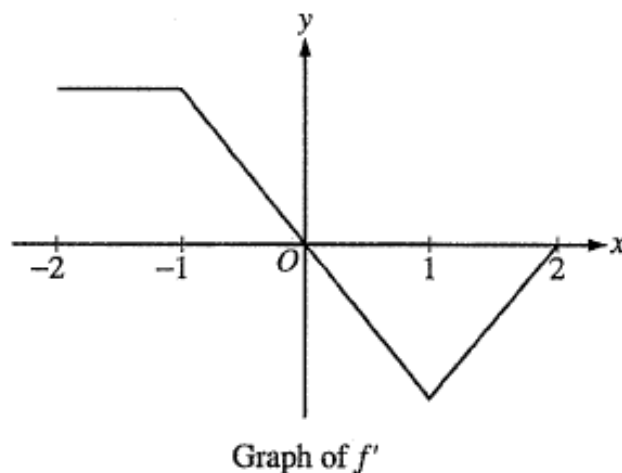
- The derivative g' of a function g is continuous and has exactly two zeros. Selected values of g' are given in the table above. If the domain of g is the set of all real numbers, then g is decreasing on which of the following intervals?
- (A) $-2 \leq x \leq 2$ only
 (B) $-1 \leq x \leq 1$ only
 (C) $x \geq -2$
 (D) $x \geq 2$ only
 (E) $x \leq -2$ or $x \geq 2$

9)



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

10.



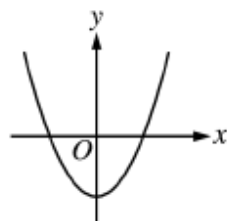
The graph of f' , the derivative of the function f , is shown above. Which of the following statements is true about f ?

- (A) f is decreasing for $-1 \leq x \leq 1$.
- (B) f is increasing for $-2 \leq x \leq 0$.
- (C) f is increasing for $1 \leq x \leq 2$.
- (D) f has a local minimum at $x = 0$.
- (E) f is not differentiable at $x = -1$ and $x = 1$.

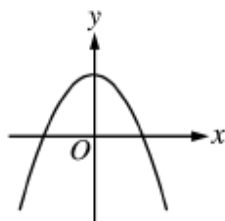
11.

88. The derivative of a function f is increasing for $x < 0$ and decreasing for $x > 0$. Which of the following could be the graph of f ?

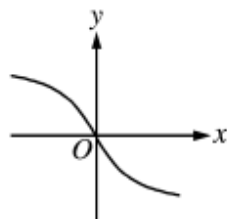
(A)



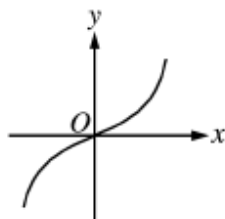
(B)



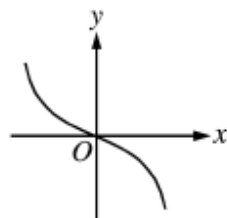
(C)



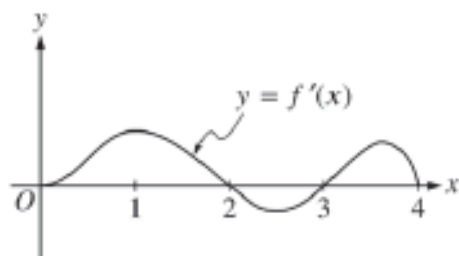
(D)



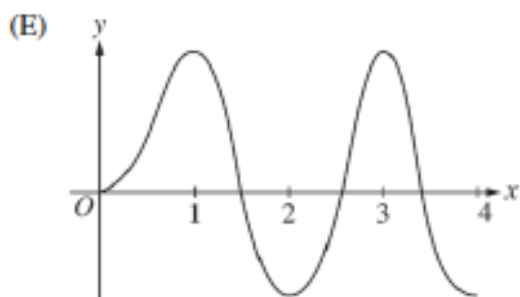
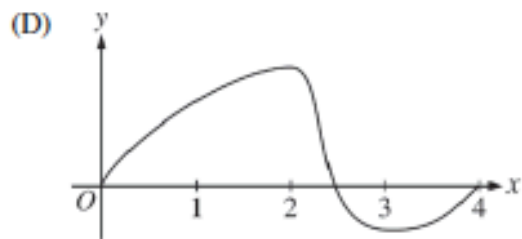
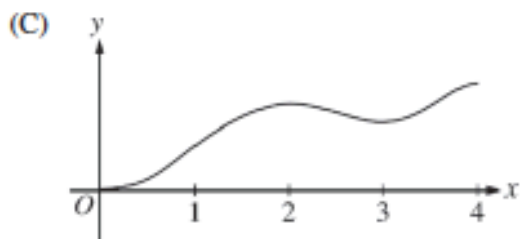
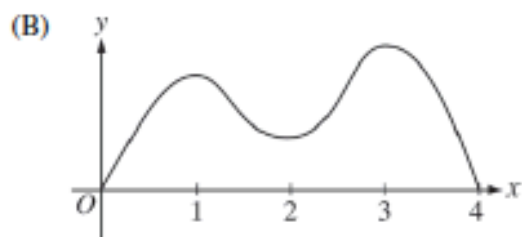
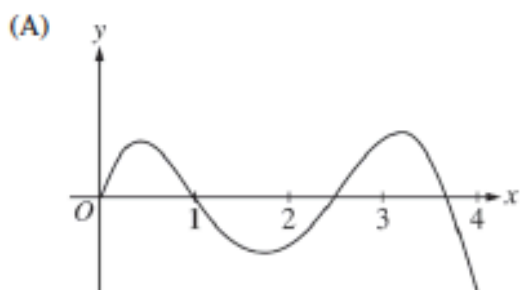
(E)



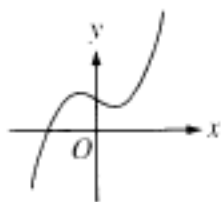
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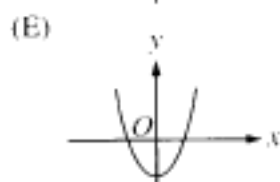
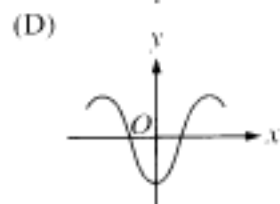
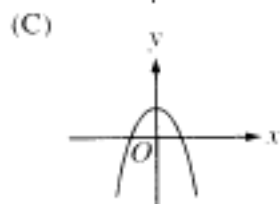
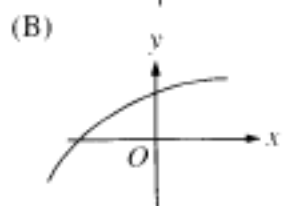
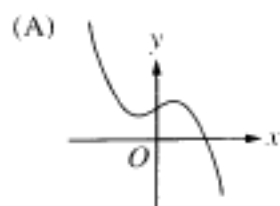
79. The figure above shows the graph of f' , the derivative of the function f . If $f(0) = 0$, which of the following could be the graph of f ?



13.



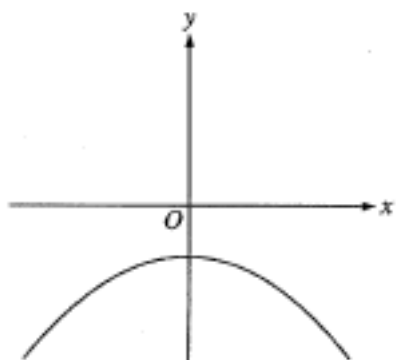
6. The graph of $y = h(x)$ is shown above. Which of the following could be the graph of $y = h'(x)$?



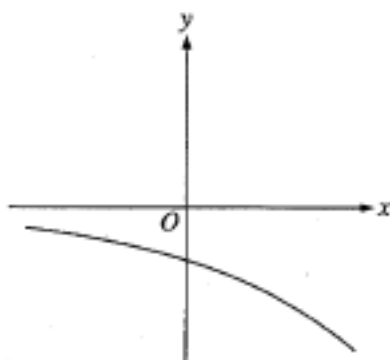
14.

10. 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 ?

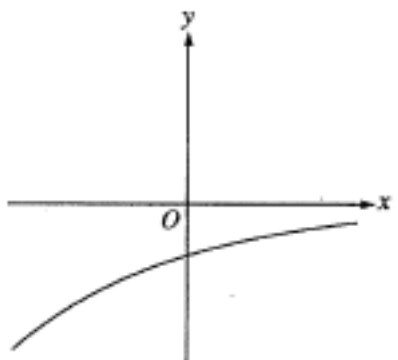
(A)



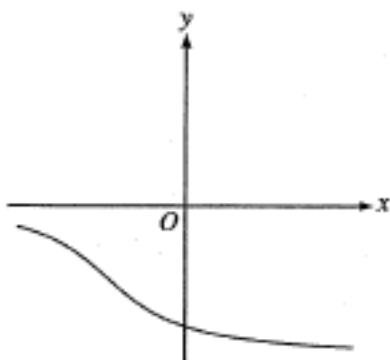
(B)



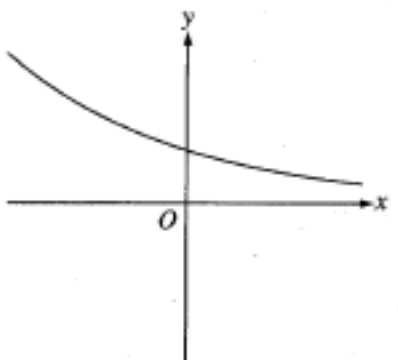
(C)



(D)



(E)



ANSWERS

- 1 e
- 2 d
- 3 b
- 4 d
- 5 d
- 6 a
- 7 a
- 8 a
- 9 a
- 10 b
- 11 e
- 12 c
- 13 e
- 14 b