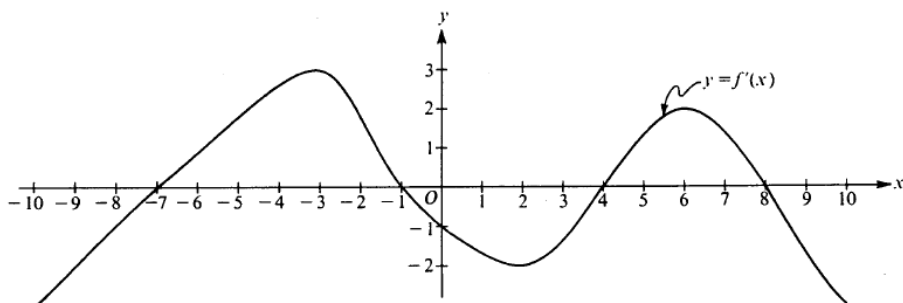
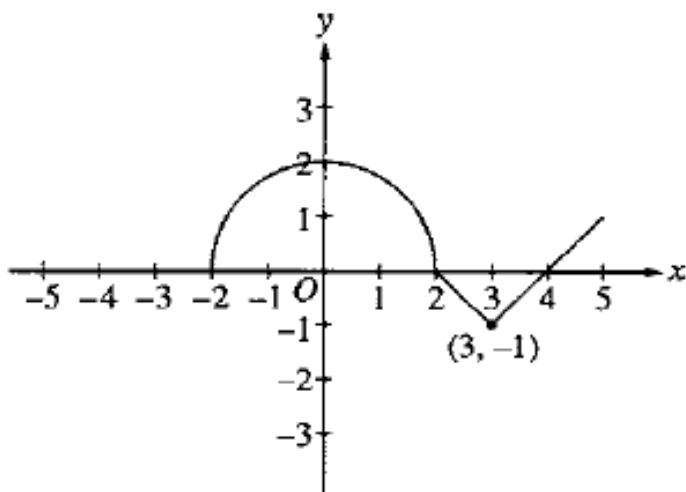


## AP Calculus: Interpreting Derivative Graphs



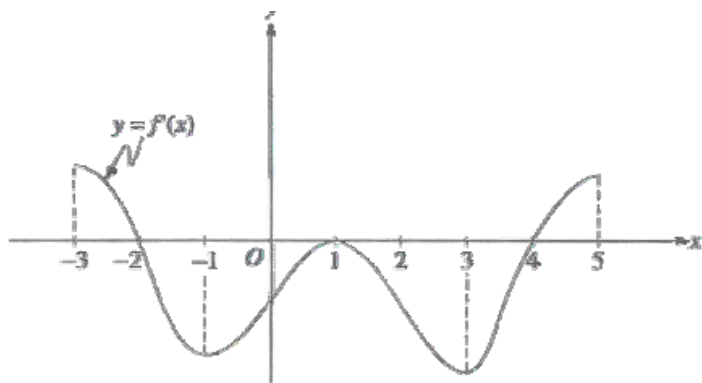
Note: This is the graph of the derivative of  $f$ , not the graph of  $f$ .

- 1) Is  $f(x)$  differentiable on the interval  $[-10, 10]$ ? Explain
- 2) Is  $f(x)$  continuous on the interval  $[-10, 10]$ ? Explain.
- 3) State the value(s) of  $x$  where the derivative is zero.
- 4) State the value(s) of  $x$  where  $f(x)$  has a relative maximum. Justify.
- 5) State the value(s) of  $x$  where  $f(x)$  has a relative minimum. Justify.
- 6) State the interval(s) where  $f(x)$  is increasing. Justify.
- 7) State the interval(s) where  $f(x)$  is decreasing. Justify.
- 8) State the value(s) where  $f(x)$  has a point of inflection. Justify.
- 9) State the interval(s) where  $f(x)$  is concave up. Use  $f'$  to justify your answer.
- 10) State the interval(s) where  $f(x)$  is concave down. Use  $f'$  to justify your answer.



**This is the graph of the derivative of  $g$ , NOT the graph of  $g$ .**

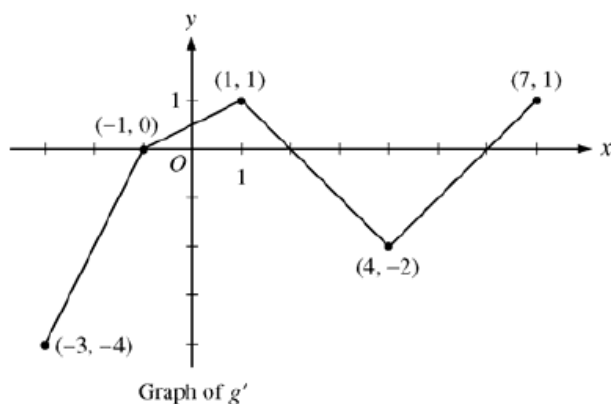
- 11) Is  $g(x)$  differentiable on the interval  $[-2, 5]$ ? Explain
- 12) Is  $g(x)$  continuous on the interval  $[-2, 5]$ ? Explain.
- 13) State the value(s) of  $x$  where the derivative is zero.
- 14) State the value(s) of  $x$  where  $g(x)$  has a relative maximum. Justify.
- 15) State the value(s) of  $x$  where  $g(x)$  has a relative minimum. Justify.
- 16) State the interval(s) where  $g(x)$  is increasing. Justify.
- 17) State the interval(s) where  $g(x)$  is decreasing. Justify.
- 18) State the value(s) where  $g(x)$  has a point of inflection. Justify.
- 19) State the interval(s) where  $g(x)$  is concave up. Use  $f'$  to justify your answer.
- 20) State the interval(s) where  $g(x)$  is concave down. Use  $f'$  to justify your answer.



Note: This is the graph of the derivative of  $f$ , not the graph of  $f$ .

The figure above shows the graph of  $f'$ , the derivative of a function  $f$ . The domain of  $f$  is the set of all real numbers  $x$  such that  $-3 < x < 5$ .

- 21) Is  $f(x)$  differentiable on the interval  $[-3, 5]$ ? Explain
- 22) Is  $f(x)$  continuous on the interval  $[-3, 5]$ ? Explain.
- 23) State the value(s) of  $x$  where the derivative is zero.
- 24) State the value(s) of  $x$  where  $f(x)$  has a relative maximum. Justify.
- 25) State the value(s) of  $x$  where  $f(x)$  has a relative minimum. Justify.
- 26) State the interval(s) where  $f(x)$  is increasing. Justify.
- 27) State the interval(s) where  $f(x)$  is decreasing. Justify.
- 28) State the value(s) where  $f(x)$  has a point of inflection. Justify.
- 29) State the interval(s) where  $f(x)$  is concave up. Use  $f'$  to justify your answer.
- 30) State the interval(s) where  $f(x)$  is concave down. Use  $f'$  to justify your answer.



**This is the graph of the derivative of  $g$ , NOT the graph of  $g$ .**

- 31) Is  $g(x)$  differentiable on the interval  $[-3, 7]$ ? Explain
- 32) Is  $g(x)$  continuous on the interval  $[-3, 7]$ ? Explain.
- 33) State the value(s) of  $x$  where the derivative is zero.
- 34) State the value(s) of  $x$  where  $g(x)$  has a relative maximum. Justify.
- 35) State the value(s) of  $x$  where  $g(x)$  has a relative minimum. Justify.
- 36) State the interval(s) where  $g(x)$  is increasing. Justify.
- 37) State the interval(s) where  $g(x)$  is decreasing. Justify.
- 38) State the value(s) where  $g(x)$  has a point of inflection. Justify.
- 39) State the interval(s) where  $g(x)$  is concave up. Use  $g'$  to justify your answer.
- 40) State the interval(s) where  $g(x)$  is concave down. Use  $g'$  to justify your answer.