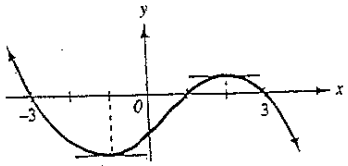
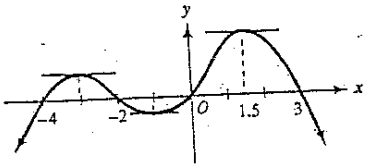
In Exercises 1 through 6, the accompanying figure shows the graph of the derivative of a function f whose domain is the set of all real numbers and which is continuous everywhere. These graphs are the same as those shown in the indicated exercise of Exercises 3.4. From this graph, determine the abscissas of any points of inflection of the graph of f and where the graph of f is concave upward and concave downward. Incorporate this information and the information obtained in the corresponding exercise of Section 3.4 in a table similar to Tables 2 and 3 of this section. Sketch a possible graph of f having the properties in the table if the only zeros of f are those stated.

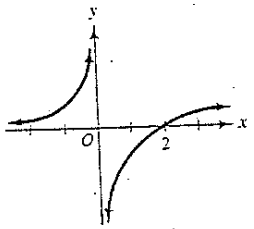
1. Refer to Exercise 39 of Exercises 3.4. Zeros of f are -4, -1, 2, and 4.



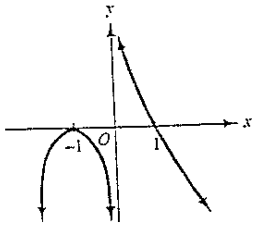
2. Refer to Exercise 40 of Exercises 3.4. Zeros of f are -1, 2, and 4.



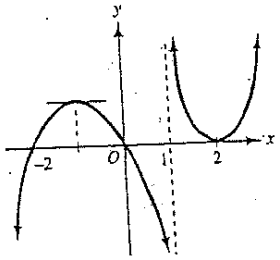
3. Refer to Exercise 41 of Exercises 3.4. Zeros of f are 0 and 4.



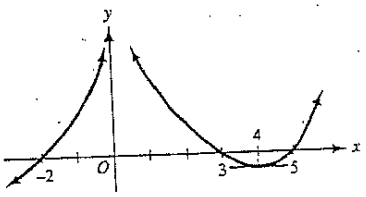
4. Refer to Exercise 42 of Exercises 3.4. Zeros of f are -1 and 1.



5. Refer to Exercise 43 of Exercises 3.4. Zero of f is 1.

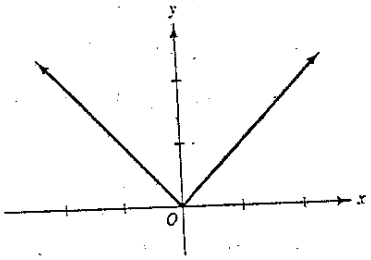


6. Refer to Exercise 44 of Exercises 3.4. Zeros of f are -3 and 0.

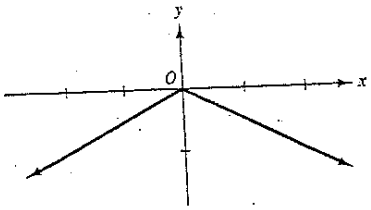


In Exercises 7 through 18, the accompanying figure shows the graph of the derivative of a function f whose domain is the set of all real numbers and which is continuous everywhere. From the graph, determine the following information and incorporate this information in a table similar to Tables 2 and 3 of this section: (i) the intervals on which f is increasing; (ii) the intervals on which f is decreasing; (iii) the relative extrema of f; (iv) where the graph of f is concave upward; (v) where the graph of f is concave downward; (vi) the abscissas of any points of inflection of the graph of f. Sketch a possible graph of f having the properties in the table if the only zeros of f are those stated.

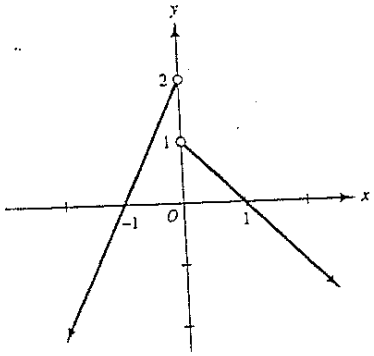
7. Zero of f is 0.



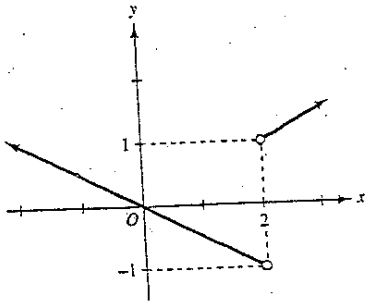
8. Zero of f is 0.



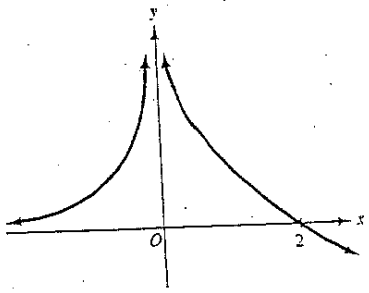
9. Zeros of f are -2, 0, and 2.



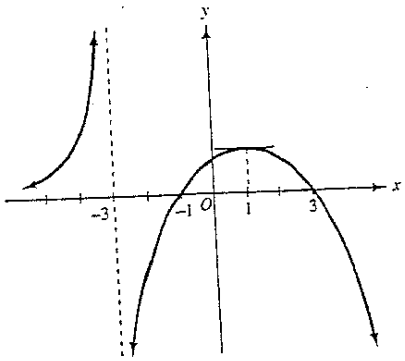
10. Zeros of f are 0 and 4.



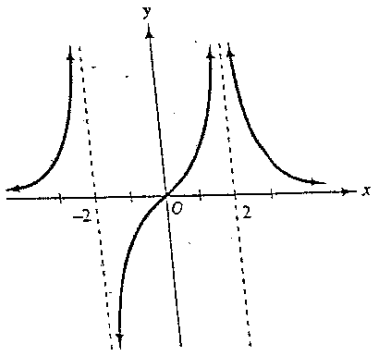
11. Zeros of f are 0 and 3.



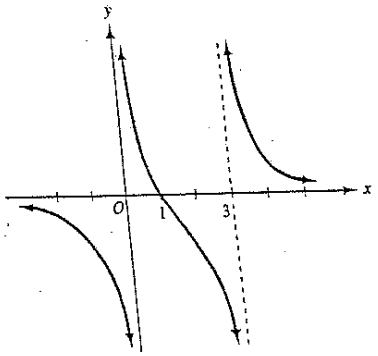
12. Zeros of f are -4, -2, 1, and 5.



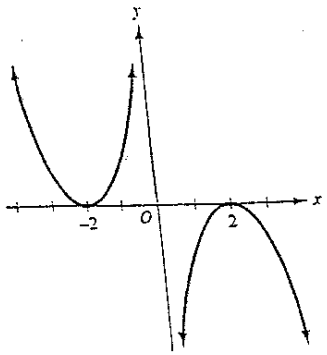
13. Zeros of f are -3, -1, and 1.



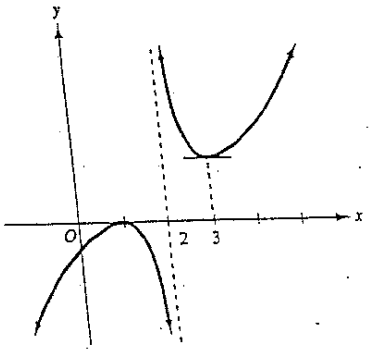
14. Zeros of f are 0 and 3.



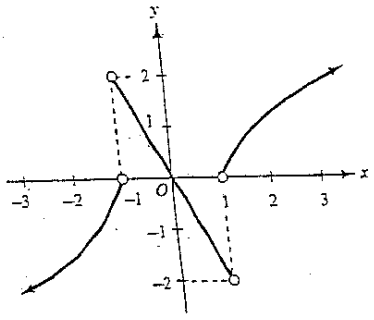
15. Zeros of f are -2 and 2.



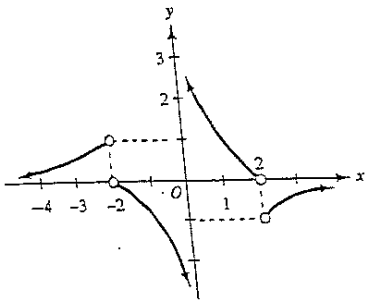
16. Zeros of f are 1 and 3.



17. Zeros of f are -2, 0, and 2.

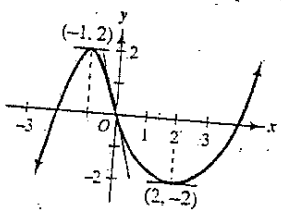


18. Zeros of f are -3, 0, and 3.

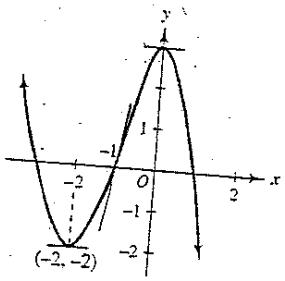


In Exercises 19 through 26, the graph of a function f and segments of the inflectional tangents appear in the accompanying figure. Determine the following information from the figure and incorporate this information in a table similar to Table 4: (i) the intervals on which f is increasing; (ii) the intervals on which f is decreasing; (iii) the relative extrema of f; (iv) where the graph of f is concave upward; (v) where the graph of f is concave downward; (vi) the abscissas of any points of inflection of the graph of f. From the table sketch possible graphs of f′ and f″.

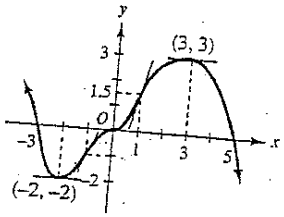
19.



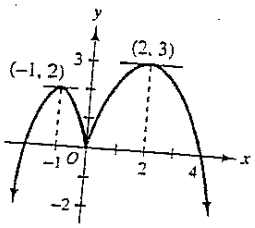
20.



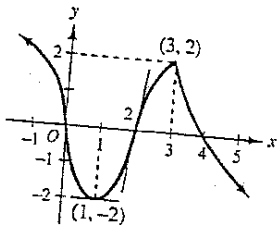
21.



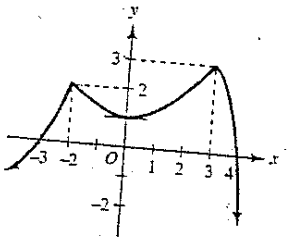
22.



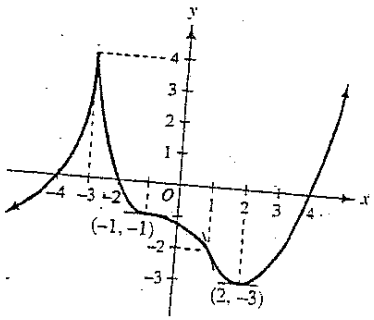
23.



24.



25.



26.