

Workbook



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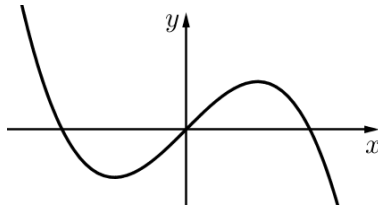
Graphs of a Function and its Derivative

Graphs of a Function and its Derivative

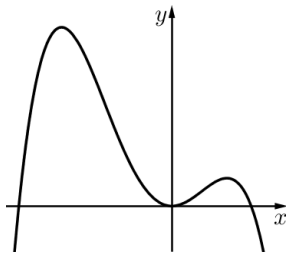
Example Questions

Given the graph of $y = f(x)$, sketch the graph of $y = f'(x)$:

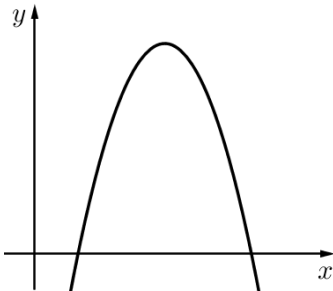
1)



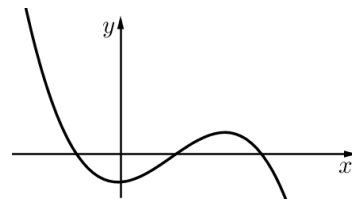
2)



3)

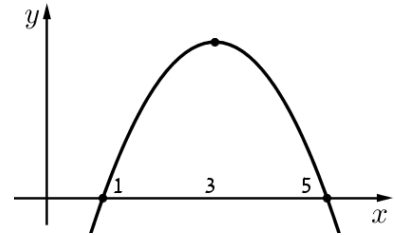


4)

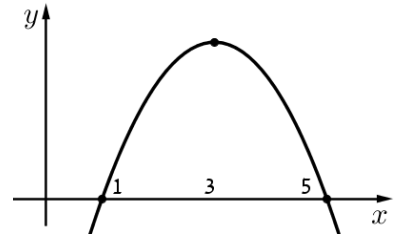


Exercises Questions:

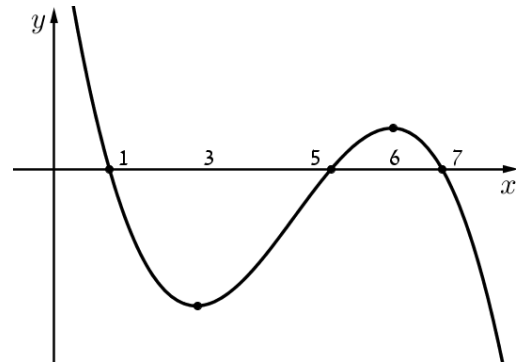
- 1) Given the graph of $y = f'(x)$
- Find all local extrema point of function $y = f(x)$.
 - Determine the intervals where the function $y = f(x)$ is increasing and where it is decreasing.



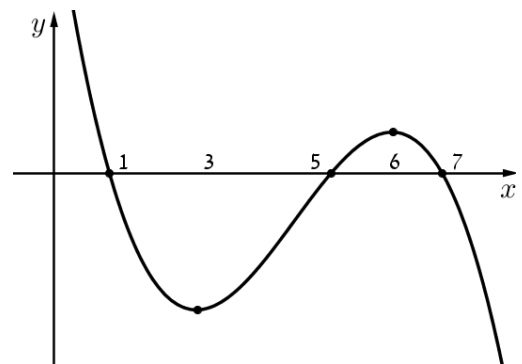
- 2) Given the graph of $y = f'(x)$
- Find the inflection points of the function $y = f(x)$.
 - Determine the intervals where the function is concave up and where it is concave down.



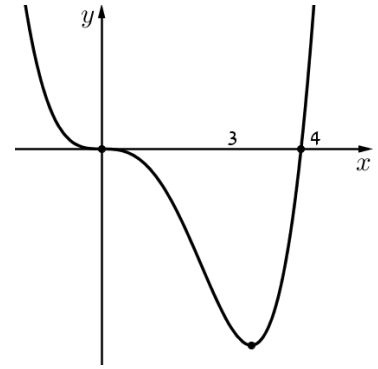
- 3) Given the graph of $y = f'(x)$
- Find all local extrema point of function $y = f(x)$.
 - Determine the intervals where the function $y = f(x)$ is increasing and where it is decreasing.



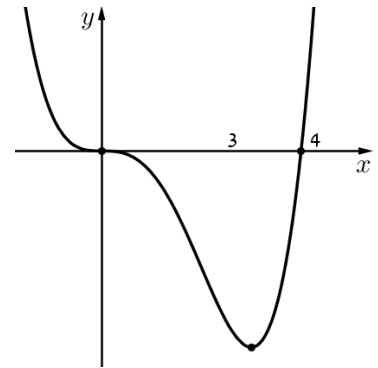
- 4) Given the graph of $y = f'(x)$
- Find all local extrema point of function $y = f(x)$.
 - Determine the intervals where the function $y = f(x)$ is increasing and where it is decreasing.



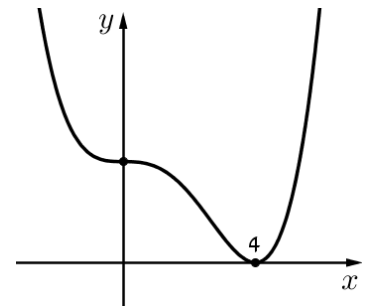
- 5) Given the graph of $y = f'(x)$
- Find all local extrema point of function $y = f(x)$.
 - Determine the intervals where the function $y = f(x)$ is increasing and where it is decreasing.



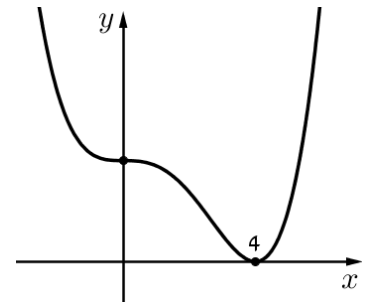
- 6) Given the graph of $y = f'(x)$
- Find the inflection points of the function $y = f(x)$.
 - Determine the intervals where the function is concave up and where it is concave down.



- 7) Given the graph of $y = f'(x)$
- Find all local extrema point of function $y = f(x)$.
 - Determine the intervals where the function $y = f(x)$ is increasing and where it is decreasing.



- 8) Given the graph of $y = f'(x)$
- Find the inflection points of the function $y = f(x)$.
 - Determine the intervals where the function is concave up and where it is concave down.



Answer Key

- 1) a. Min: $x = 1$ max: $x = 5$ b. Increase: $1 < x < 5$ decrease: $x < 1$ $x > 5$
- 2) a. Inf: $x = 3$ b. Up: $x < 3$ down: $x > 3$
- 3) a. Min: $x = 5$ max: $x = 1; x = 7$
b. Increase: $x < 1$ or $5 < x < 7$ decrease: $0 < x < 5$ or $x > 7$
- 4) a. Inf: $x = 3; x = 6$ b. Up: $5 < x < 6$ down: $x < 3$ or $x > 6$
- 5) a. Min: $x = 4$ max: $x = 0$ b. Increase: $x < 0$ or $x > 4$
- 6) a. Inf: $x = 3$ b. Up: $x > 3$ down: $x < 3$
- 7) a. No extrema
b. No decreasing, decreasing everywhere for all x $-\infty < x < -\infty$ $x \in (-\infty, \infty)$
- 8) a. Inf: $x = 4$ b. Up: $x > 4$ down: $x < 4$