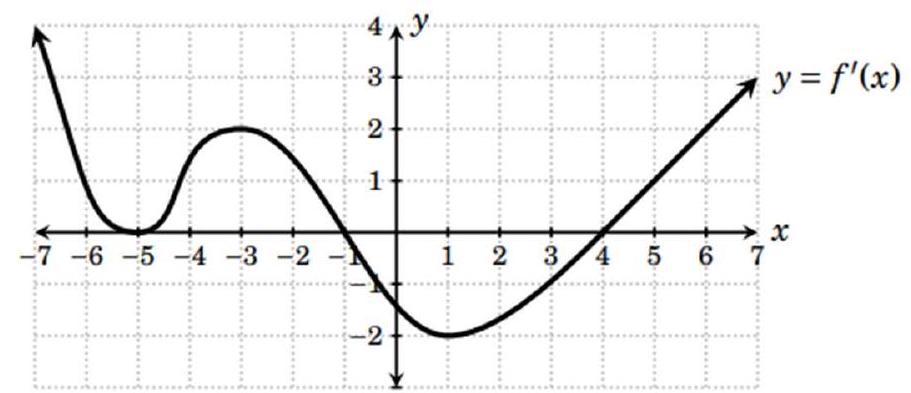
# Curve Sketching

1. Locate the absolute extrema on the given intervals (if any exist) for .
2. Find the critical numbers for .
3. Find the critical numbers for on the interval .
4. Find increasing and decreasing intervals for
5. Find the absolute max and min of
6. Find relative extrema of
7. Find the absolute max and min of on
8. Find where the graph of is increasing. Justify your answer.
9. Here is a graph of f’(x)



1. State the intervals on which increases.
2. State the intervals on which decreases.
3. List all critical points of .
4. At which of its critical points does have a local maximum?
5. At which of its critical points does have a local minimum?
6. Based on this information, sketch a possible graph of above.

## Concavity

1. Find the intervals where is concave up and concave down. Find all inflection points.
2. Find the intervals where is concave up and concave down. Find all inflection points. Justify your answers.
3. Let be a function defined for all such that and the derivative of is given by .
4. Find all values of for which the graph of has a horizontal tangent, and determine whether has a relative maximum, a relative minimum, or neither at each of these values. Justify your answers.
5. On what intervals, if any, is the graph of concave up? Justify your answer.
6. Write the equation of the tangent line of at .
7. A graph of a function

   Description automatically generatedDoes the line tangent to the graph of at lie above of below the graph of f(x) when . Why?
8. See the graphs of and
9. Determine the critical numbers of .

1. Where is increasing?
2. Where is decreasing?
3. At what values of does have a local max?
4. At what values of does have a local min?
5. Where is concave down?
6. Where is concave up?
7. At what values of does has points of inflection?