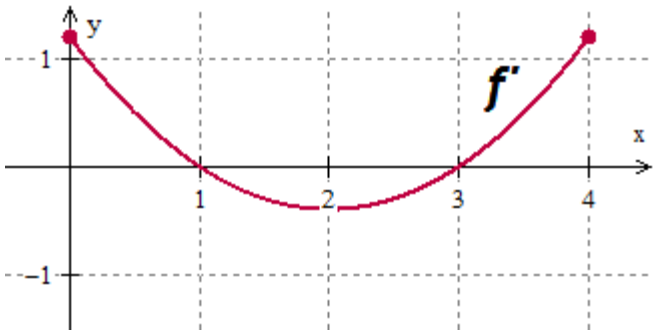
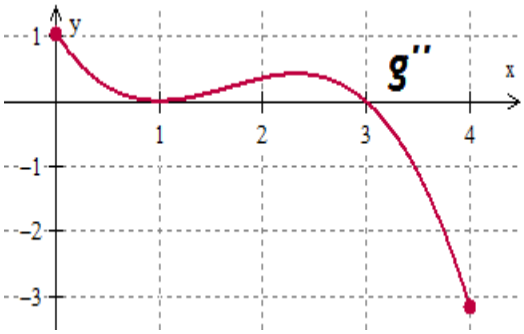
Interpreting the derivative 2



1. On what intervals is f increasing? Decreasing?
2. Where is f concave up and concave down?
3. Where does f have a local maximum? A local minimum? Justify your answer.
4. Where does f have a point of inflection? Justify your answer.
5. Where does f have its minimum value on the interval [0,3]? Its maximum value?
6. Rank f(0), f(1), f(2), f(3) in order from least to greatest.
7. Assume $f(0)=0$. Sketch a graph of f.

Consider the graph of g'' on the interval [0,4].



8. Over what intervals is g concave down? Justify your answer.
9. Over what intervals is g' concave down? Justify your answer.
10. Where is there a point of inflection on g?
11. Where is there a point of inflection on g'?

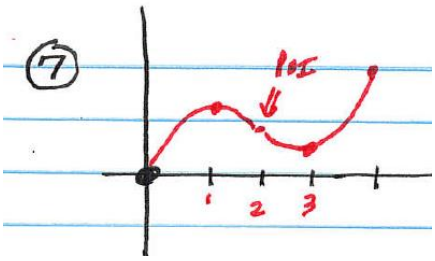
Consider $f'(x)=.8x\sin(x-1)$ on [-1,4].

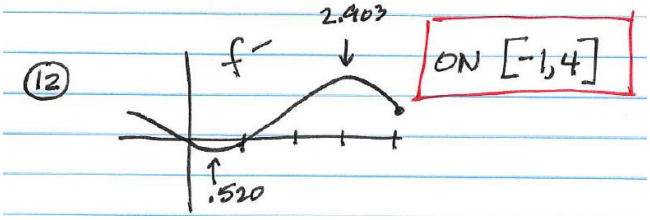
12. Draw $f'(x)$ in box. Use an appropriate window.
13. Find $f''(2.56)$.
14. Find $f'(2.56)$.
15. On what intervals is f increasing? Decreasing?
16. Where is f concave up and concave down?
17. Where does f have a local maximum? A local minimum? Justify your answer.
18. Where does f have a point of inflection? Justify your answer.

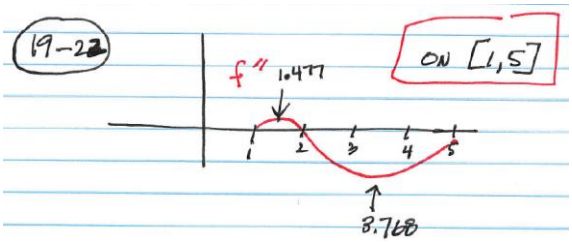
Consider $f''(x)=\ln(x)\cdot\sin(2-x)$ on [1,5].

19. Over what intervals is g concave down? Justify your answer.
20. Over what intervals is g' concave down? Justify your answer.
21. Where is there a point of inflection on g?
22. Where is there a point of inflection on g'?

Answers

1. INC: (0,1) (3,4)
   DEC: (1,3)
2. CCDWN: (0,2)
   CCUP: (2,4)
3. REL MAX: x=1, f' switches from positive to negative
   RELMIN: x=3, f' switches from negative to positive
4. x = 2, f' switches from decreasing to increasing
5. min at x = 0
   max at x = 1
6. f(0), f(3), f(2), f(1)
7. 

8. (3,4); g'' is negative
9. (0, 1), (2.3, 4); g'' is decreasing
10. x = 3
11. x = 1, 2.3
12. 

13. 0.822
14. 2.048
15. INC: (-1, 0) (1,4)
    DEC: (0,1)
16. CCDWN: (-1,0.520)(2.903,4)
    CCUP: (0.520,2.903)
17. REL MAX: x=0, f' switches from positive to negative
    RELMIN: x=1, f' switches from negative to positive
18. At x= .520 POI: f' switches from decreasing to increasing
    At x= 2.903 POI: f' switches from increasing to decreasing
19. 

20. (2,5) f'' is negative
21. (1.477, 3.768)
22. x = 2
23. x = 1.477 and 3.768