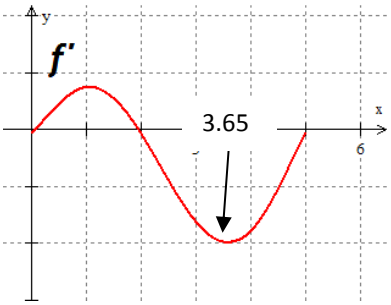
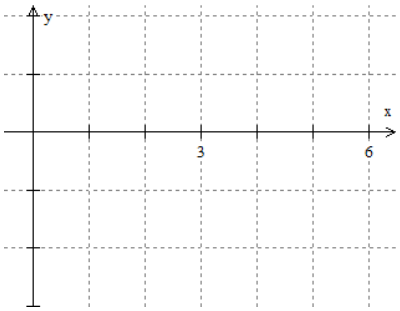
CURVE SKETCHING

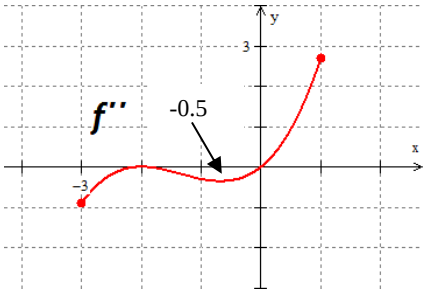
Use the graph of the derivative of f at the right on [0,5].





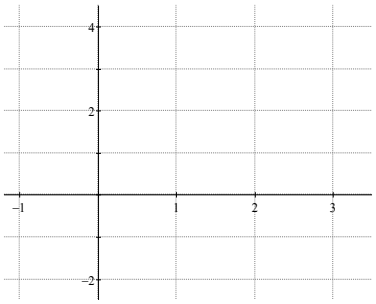
1. Where is f concave up? Justify your answer.
2. Where is f decreasing? Justify your answer.
3. Name the x values of any point(s) of inflection on f.
4. Name any relative minimum on f. JYA.
5. Name the equation of the tangent at x=4, if f(4) = -3
6. If f(0) = 0, sketch a graph of f on the grid provided.

Use the graph of the second derivative of f on [-3,1].



7. Name where f' is decreasing?
8. Where is f' concave up? Justify your answer.
9. Where is f concave up? Justify your answer.
10. Name the x values of any points of inflection on f.
11. Name the x –values of any points of inflection on f'.

12. Draw a curve in the box such that $f'(x)<0$ and $f''(x)>0$.
13. Find the value of k if $f(x)=x^3-3kx^2-4x$ has a point of inflection x = -4.
14. Graph f given that f(0) = -1, f(1) = 1, f(3) = 3 and the chart below.



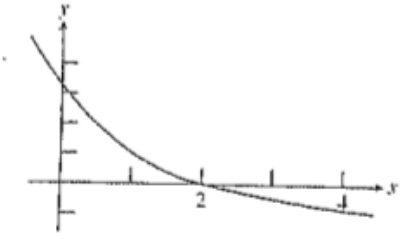
	$(-\infty,0)$	$(0,1)$	$(1,3)$	$(3,\infty)$
f'	negative	positive	positive	positive
f''	negative	negative	positive	negative

MULTIPLE CHOICE

15. What is the x-coordinate of the point of inflection of $y=\frac{1}{10}x^5+\frac{1}{2}x^4-\frac{3}{10}$?

a. -4
b. -3
c. -1
d. -3/10

16. The graph of a twice differential equation f is shown. Which is true?



a. $f(2)<f'(2)<f''(2)$
b. $f(2)<f''(2)<f'(2)$
c. $f'(2)<f(2)<f''(2)$
d. $f''(2)<f(2)<f'(2)$
e. $f''(2)<f'(2)<f(2)$

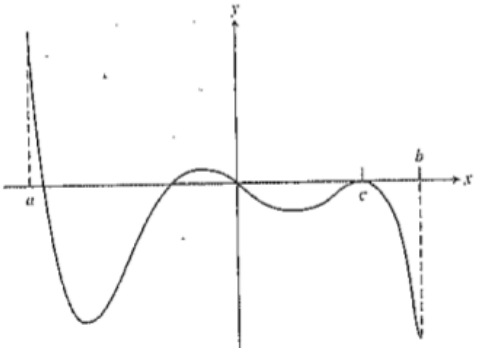
17. $f(x) = -x^6 + x^3 - 2$. On which interval is f decreasing?

a. $(-\infty, 0)$
b. $\left(-\infty, \sqrt[3]{\frac{1}{2}}\right)$
c. $\left(0, \sqrt[3]{\frac{1}{2}}\right)$
d. $(0, \infty)$
e. $\left(\sqrt[3]{\frac{1}{2}}, \infty\right)$

18. Where does $f(x) = x^4 - x^2$ have a relative minimum?

a. $\sqrt{2}$
b. 1
c. $\frac{\sqrt{2}}{2}$
d. ½
e. 0

19. The graph of f' is shown. It is tangent to the x-axis at point c. Which of the following describes the relative extrema on (a,b).

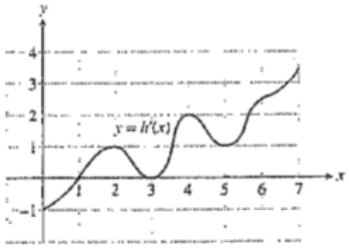


a. One relative maximum and one relative minimum
b. One relative maximum and two relative minima
c. Three relative maxima and two relative minima
d. Two relative maxima and two relative minima
e. Two relative maxima and one relative minimum

Use the graph of $h'(x)$ for 20-22.

20. At what value does h(x) have its absolute minimum?

a. 0
b. 1
c. 3
d. 5
e. 7



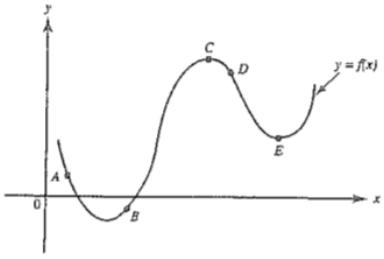
21. The point (5,2) is on the graph of $y = h(x)$. An equation of the line tangent to h(x) at (5,2) is

a. $y - 2 = x - 5$
b. $y = x - 2$
c. $y - 2 = 2(x - 5)$
d. $x = 5$
e. $y = 2$

22. How many inflection points does h have on (0,7)?

a. 3
b. 4
c. 5
d. 6
e. 7

23. At which point on the graph of $y = f(x)$ shown is $f'(x) < 0$ and $f''(x) > 0$.

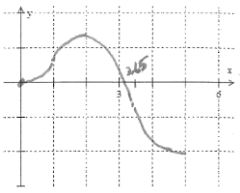
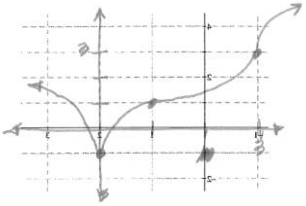


a. A
b. B
c. C
d. D
e. E

24. The only function that does not satisfy the Mean Value Theorem on the interval specified is

a. $f(x) = x^2 - 2x$ on $[-3,1]$
b. $f(x) = \frac{1}{x}$ on $[1,3]$
c. $f(x) = \frac{x^3}{3} - \frac{x^2}{2} + x$ on $[-1,2]$
d. $f(x) = x + \frac{1}{x}$ on $[-1,1]$
e. $f(x) = x^{2/3}$ on $\left[\frac{1}{2}, \frac{3}{2}\right]$

Answers!

1. (0,1), (3.65,5); F' IS INCREASING
2. (2,5); F' IS NEGATIVE
3. X = 1, 3.65
4. NONE, F' NEVER SWITCHES FROM NEG TO POSITIVE.
5. $Y + 3 = -1.8(X - 4)$
6. 
7. (-3,0) F'' IS NEGATIVE
8. (-3,-2) (-0.5,1) F'' IS INCREASING
9. (0,1) F'' IS POSITIVE
10. 0 ONLY!
11. -2 AND -0.5
12. 
13. K = -4
14. 
15. B
16. C
17. E
18. C
19. E
20. B
21. A
22. B
23. A
24. D