

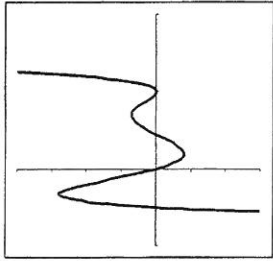
#14 FIRST AND SECOND DERIVATIVES 2.5

COMPLETE EACH BLANK WITH THE BEST ANSWER.

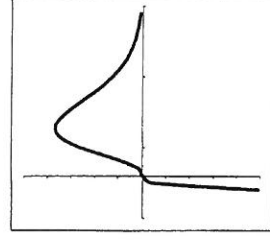
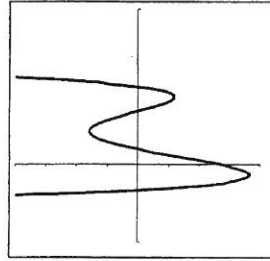
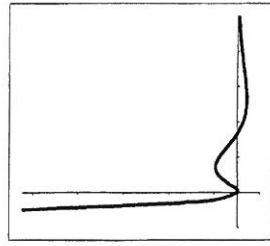
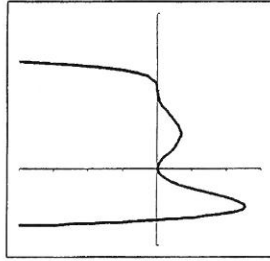
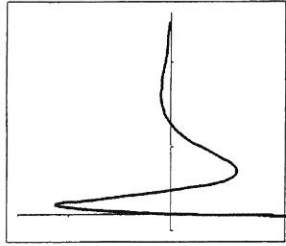
1. If $f(x)$ is increasing, then $f'(x)$ is _____.
2. $f'(x)$ is negative if $f(x)$ is _____.
3. $f''(x)$ is positive if $f'(x)$ is _____.
4. $f''(x)$ is negative if $f'(x)$ is _____.
5. If $f(x)$ is concave down, then $f'(x)$ is _____.
6. If $f'(x)$ is increasing, then $f''(x)$ is _____.
7. If $f'(x)$ is decreasing, then $f''(x)$ is _____.
8. If $f'(x) > 0$ and $f''(x) < 0$, then $f(x)$ looks like _____ [DRAW A SKETCH].
9. If $f(x)$ is an exponential decay curve, then $f'(x)$ is _____ and _____.
10. If $f(x)$ has an inflection point, then $f(x)$ has a change in _____.
11. If $f(x)$ has a horizontal tangent, then $f'(x)$ has a _____.
12. If $f'(a) = 0$, then $f(x)$ has a _____ at _____.
13. If $f'(x)$ has a change of sign and is always defined, then $f(x)$ has either a _____ or _____.
14. If $f(x)$ has a corner at $x = a$, then $f'(a)$ is _____.
15. If $f''(x) = 0$ for all values of x , then $f(x)$ is _____.
16. If $f''(x) = 0$ for all values of x , then $f(x)$ is _____.
17. If $f'(a) = 2$ and $g(x) = f(x) - 5$, then $g'(a) =$ _____.
18. If $f(x)$ is concave down everywhere, then $-f(x)$ is _____.
19. If the slope of $f(x)$ increases, then $f(x)$ is _____.
20. If $f''(x)$ has an x-intercept, then $f'(x)$ has a _____.
21. If $f(x)$ has a vertical tangent at $x = a$, then $f'(a)$ is _____.

IN EACH COLUMN OF GRAPHS YOU WILL NEED TO DETERMINE WHICH IS $f(x)$, $f'(x)$ AND $f''(x)$. INCLUDE YOUR REASONING

22.

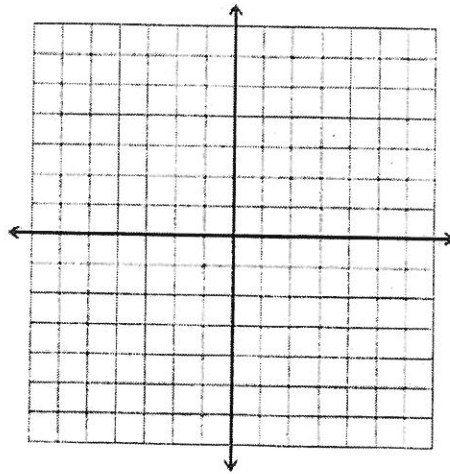


23.



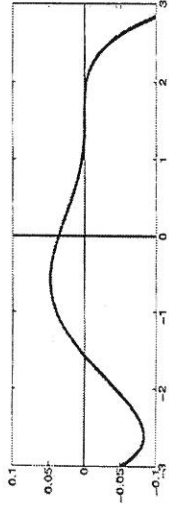
Sketch the graph of a function with the following characteristics:

1. f is continuous on $(-\infty, \infty)$
2. $f(-6) = 0$
3. $f(-4) = 3$
4. $f(-2) = 0$
5. $f(1) = 4$
6. $f(4) = 0$
7. $f'(-2) = f'(1) = 0$
8. $f'(-4)$ DNE
9. $f''(x) > 0$ on $(-\infty, -4)$ and $(-2, 1)$
10. $f''(x) < 0$ on $(-4, -2)$ and $(1, \infty)$
11. $f'''(x) > 0$ on $(-4, 0)$
12. $f'''(x) < 0$ on $(0, \infty)$
13. $f'''(x) = 0$ on $(-\infty, -4)$

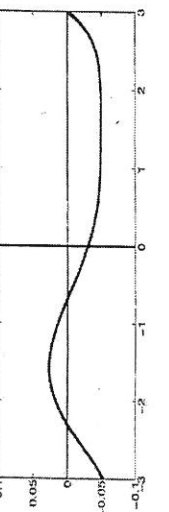
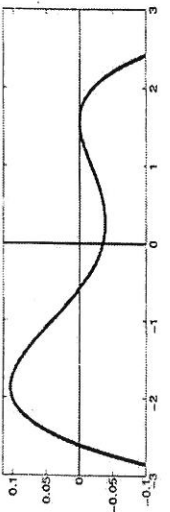
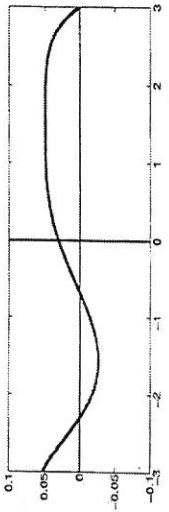
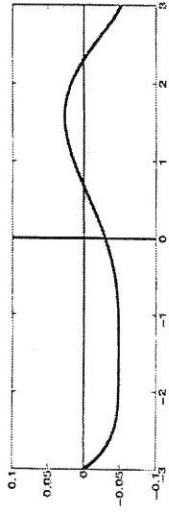


Name: _____

5. The plot below shows the graph of $y = f'(x)$.

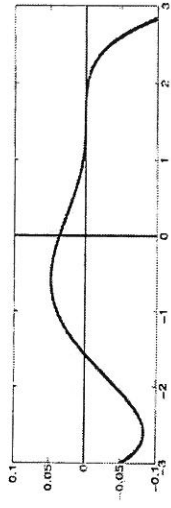


a) Which of the following functions is the graph of $y = f(x)$?

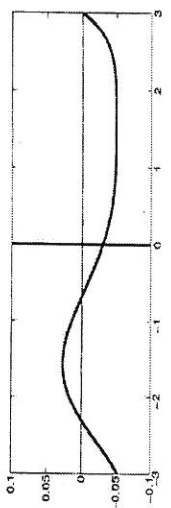
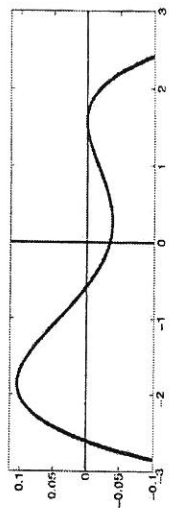
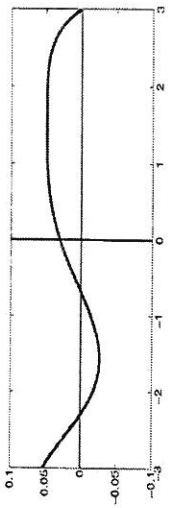
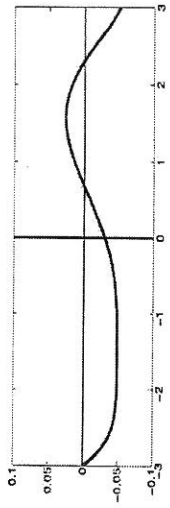


Name: _____

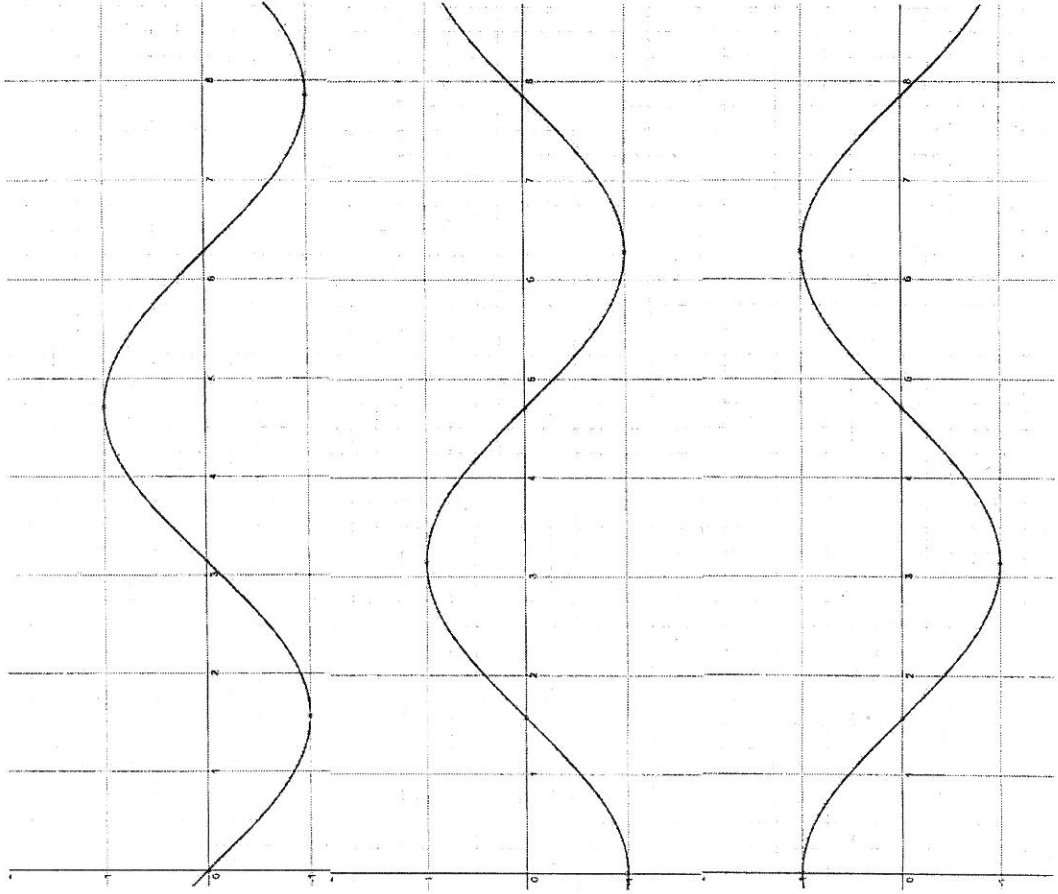
6. The plot below shows the graph of $y = f'(x)$ again.



b) Which of the following functions is the graph of $y = f''(x)$?



The graphs of f , f' , and f'' are given below in no particular order. Identify which graph is which.

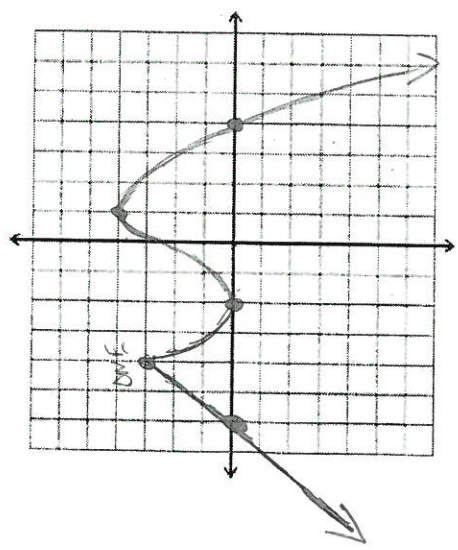


KEY

Sketch the graph of a function with the following characteristics:

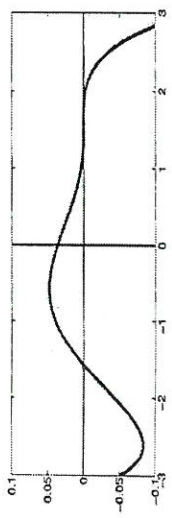
1. f is continuous on $(-\infty, \infty)$
2. $f(-6) = 0$
3. $f(-4) = 3$
4. $f(-2) = 0$
5. $f(1) = 4$
6. $f(4) = 0$
7. $f'(-2) = f'(1) = 0$
8. $f'(-4)$ DNE \rightarrow Corner / cusp
9. $f'(x) > 0$ on $(-\infty, -4)$ and $(-2, 1) \rightarrow$ incr.
10. $f'(x) < 0$ on $(-4, -2)$ and $(1, \infty) \rightarrow$ decr.
11. $f''(x) > 0$ on $(-4, 0) \rightarrow$ cup
12. $f''(x) < 0$ on $(0, \infty) \rightarrow$ cdown
13. $f'''(x) = 0$ on $(-\infty, -4) \rightarrow$ linear on $(-\infty, -4)$

y values/pts on

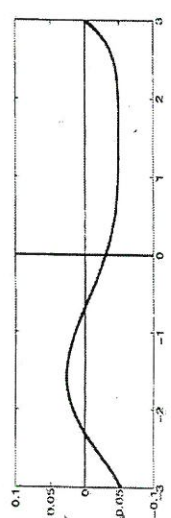
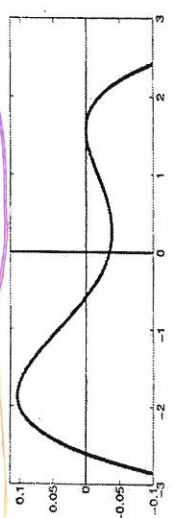
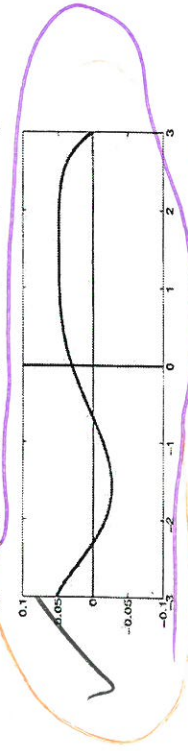
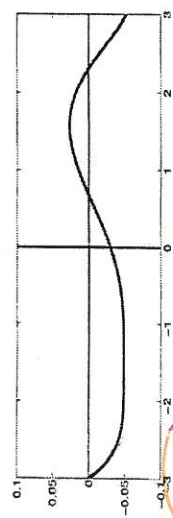


Name: _____ MATH 131-02

5. The plot below shows the graph of $y = f(x)$.

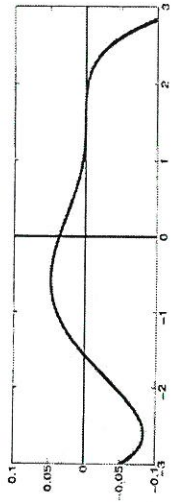


a) Which of the following functions is the graph of $y = f(x)$?

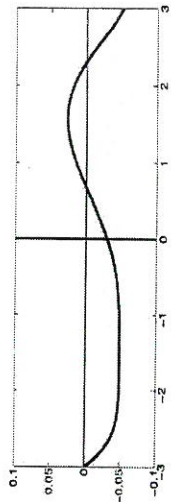


Name: _____

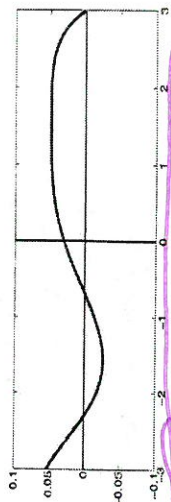
6. The plot below shows the graph of $y = f'(x)$ again.



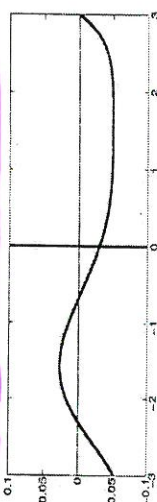
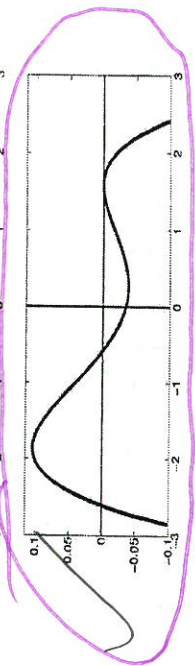
b) Which of the following functions is the graph of $y = f''(x)$?



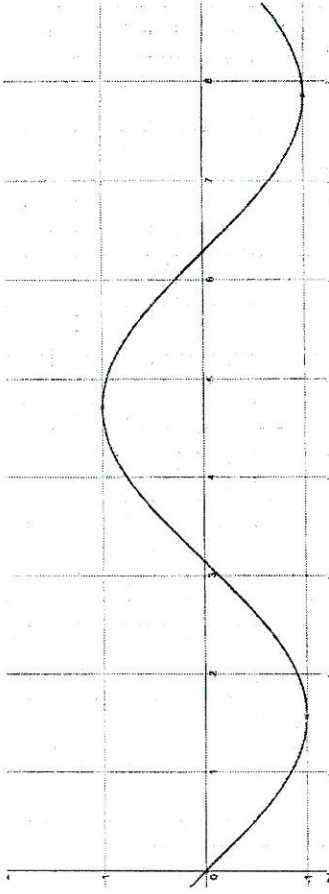
X



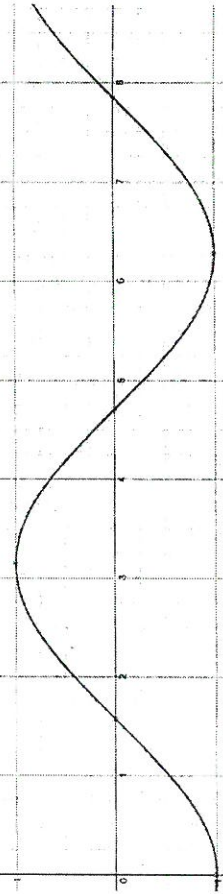
X



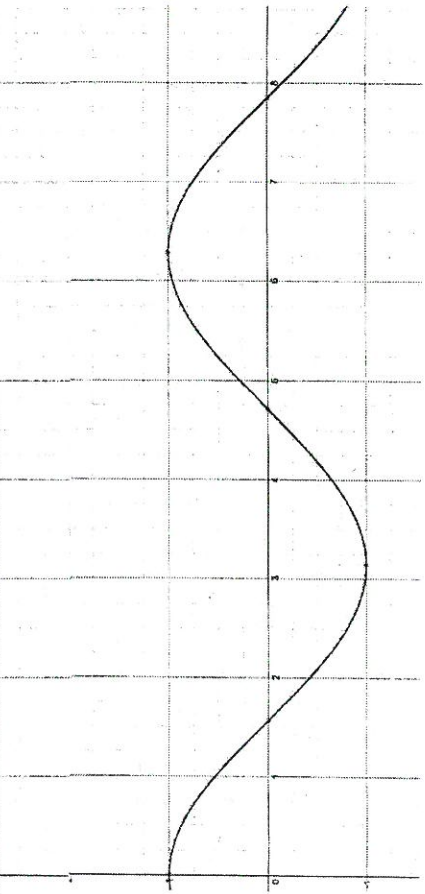
The graphs of f , f' , and f'' are given below in no particular order. Identify which graph is which.



I X



II X



III X

KEY

Math 124

Name _____

Math 124

Name _____

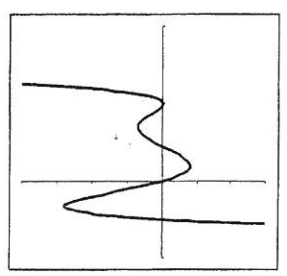
#14 FIRST AND SECOND DERIVATIVES 2.5

COMPLETE EACH BLANK WITH THE BEST ANSWER.

1. If $f(x)$ is increasing, then $f'(x)$ is 70 pos
2. $f'(x)$ is negative if $f(x)$ is decr.
3. $f''(x)$ is positive if $f(x)$ is CUP
4. $f''(x)$ is negative if $f(x)$ is decr.
5. If $f(x)$ is concave down, then $f'(x)$ is decr.
6. If $f'(x)$ is increasing, then $f''(x)$ is pos
7. If $f'(x)$ is decreasing, then $f''(x)$ is down
8. If $f'(x) > 0$ and $f''(x) < 0$, then $f(x)$ looks like [DRAW A SKETCH]
9. If $f(x)$ is an exponential decay curve, then $f'(x)$ is neg. and increasing
10. If $f(x)$ has an inflection point, then $f(x)$ has a change in concavity
11. If $f(x)$ has a horizontal tangent, then $f'(x)$ has a zero
12. If $f'(a) = 0$, then $f(x)$ has a horiz tangent at $x=a$
13. If $f'(x)$ has a change of sign and is always defined, then $f(x)$ has either a l. max or l. min
14. If $f(x)$ has a corner at $x = a$, then $f'(a)$ is undef.
15. If $f''(x) = 0$ for all values of x , then $f(x)$ is constant
16. If $f''(x) = 0$ for all values of x , then $f(x)$ is linear
17. If $f'(a) = 2$ and $g(x) = f(x) - 5$, then $g'(a) =$ 2
18. If $f(x)$ is concave down everywhere, then $-f(x)$ is CUP everywhere
19. If the slope of $f(x)$ increases, then $f(x)$ is CUP
20. If $f''(x)$ has an x-intercept, then $f'(x)$ has a max/min/extreme/horiz tangent
21. If $f(x)$ has a vertical tangent at $x = a$, then $f'(a)$ is undef.

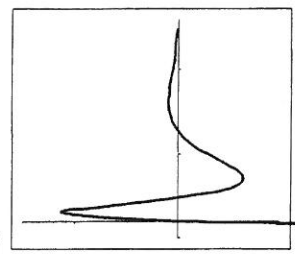
IN EACH COLUMN OF GRAPHS YOU WILL NEED TO DETERMINE WHICH IS $f(x)$, $f'(x)$ AND $f''(x)$. INCLUDE YOUR REASONING

22.



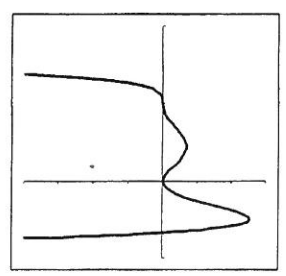
f'

23.

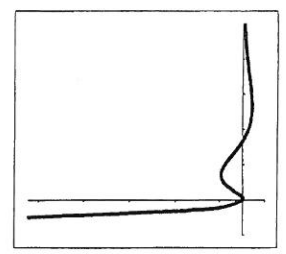


f''

f

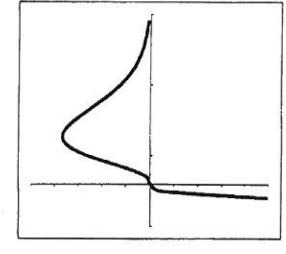
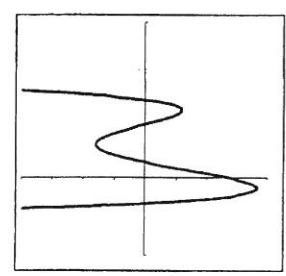


f'



f''

f''



f

