

Fill in the blank. Use the word bank, answers may be used more than once.

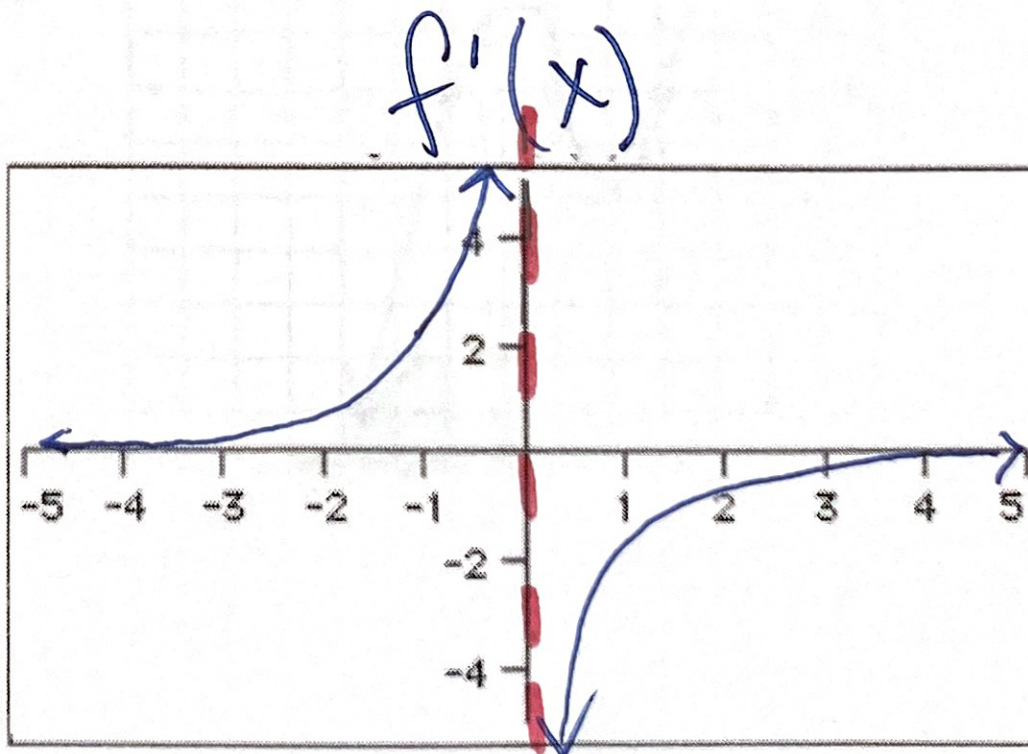
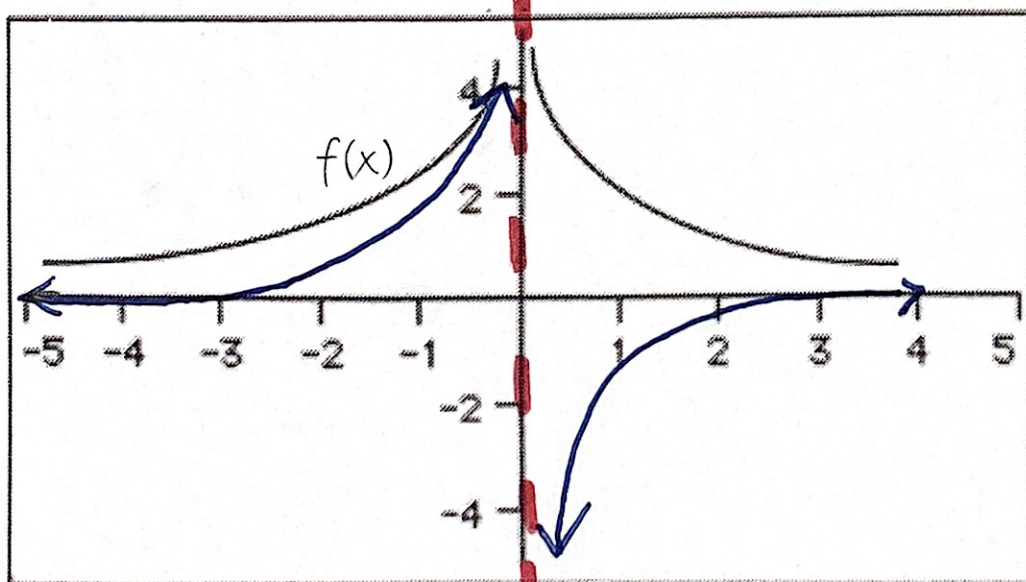
WORD BANK- increasing, decreasing, positive, negative, zero, concave up, concave down, concavity, critical point, inflection point, max, min, undefined, horizontal line.

1. If $f'(x) = 0$ for all values of x , then $f(x)$ is a constant/horizontal line
2. $f''(x)$ is positive if $f(x)$ is concave up.
3. If $f'(x)$ is increasing, then $f''(x)$ is positive.
4. If $f(x)$ is decreasing, then $f'(x)$ is negative.
5. If $f(x)$ has an inflection point, then $f(x)$ has a change in concavity
6. If $f(x)$ is concave up, then $f'(x)$ is increasing.
7. $f''(x)$ is positive if $f'(x)$ is increasing.
8. If $f'(a) = 0$, then $f(x)$ has a critical pt at $x = a$.

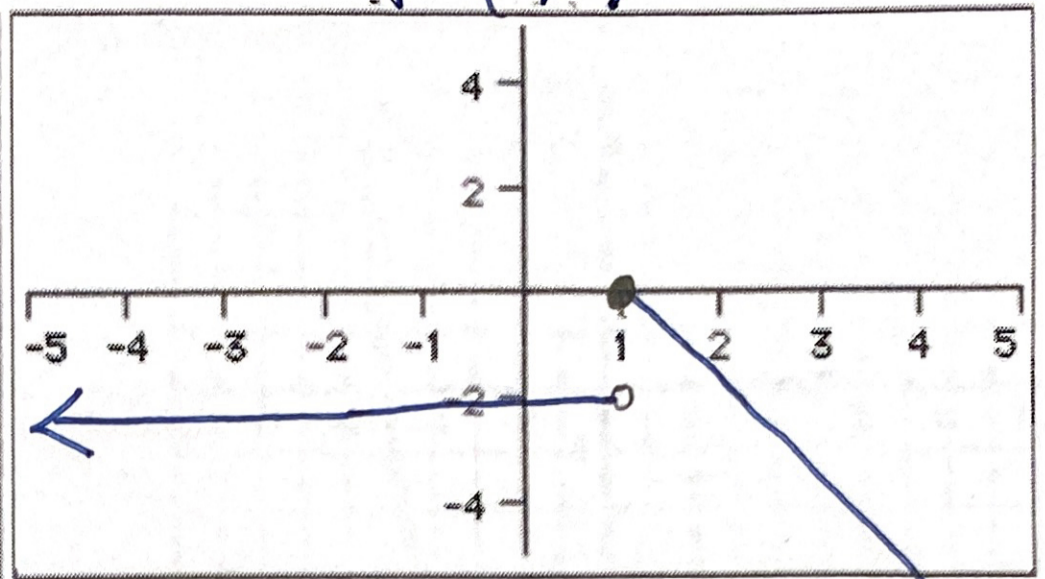
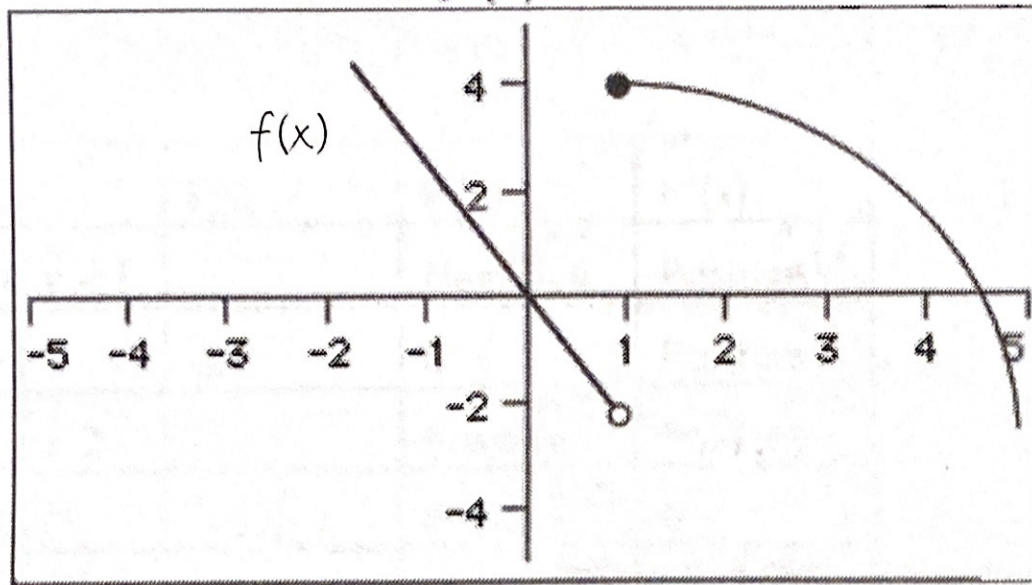
True or False.

9. If $f''(x)$ is negative then $f(x)$ is concave up. False
10. If $f''(x)$ is equal to zero, and $f'(x)$ is negative, then $f(x)$ is decreasing. True
11. If $f(x)$ is concave down, then $f'(x)$ is decreasing. True
12. If $f'(x)$ changes from positive to negative, then $f(x)$ has a relative min. False

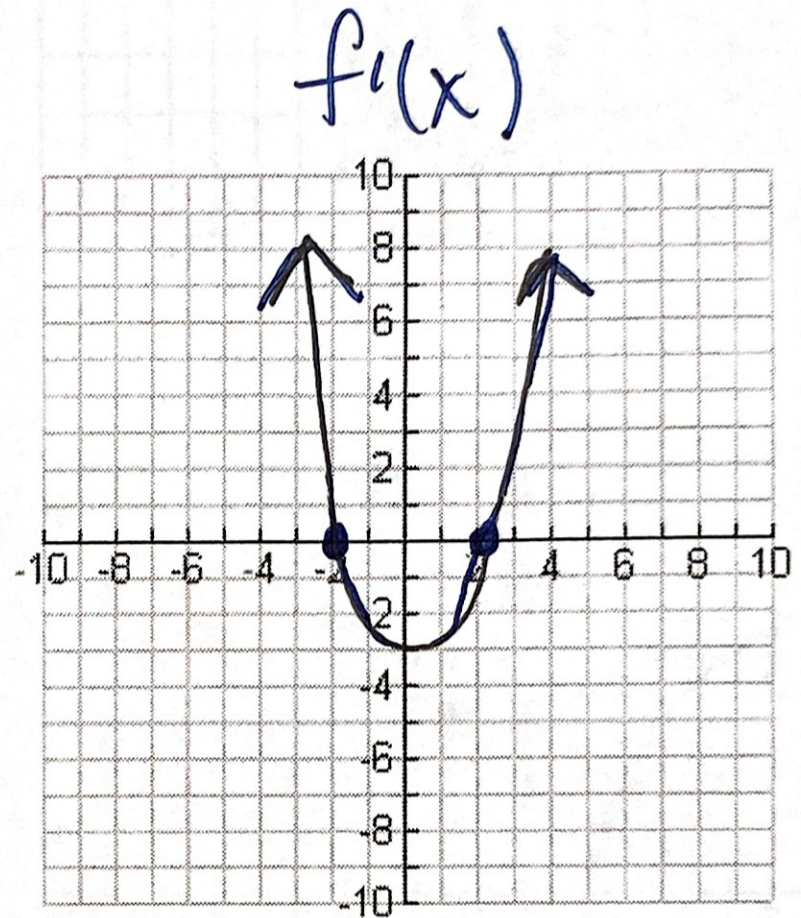
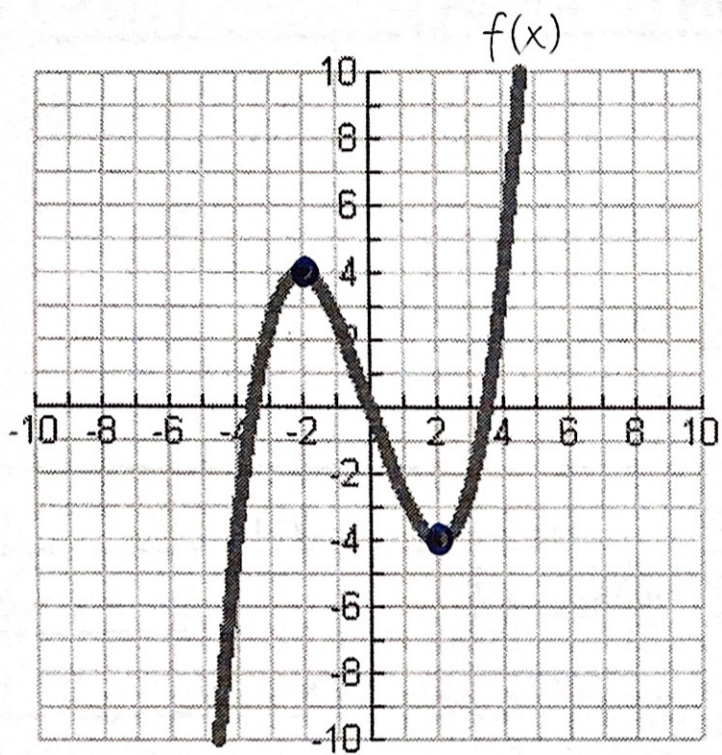
Sketch the derivative of each function.



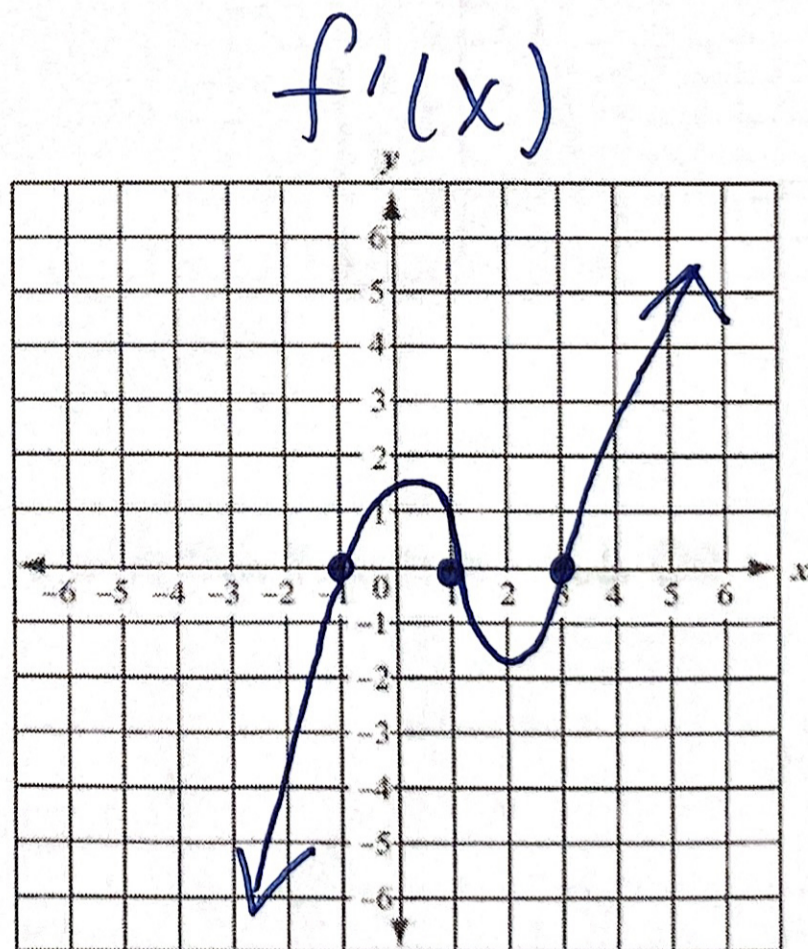
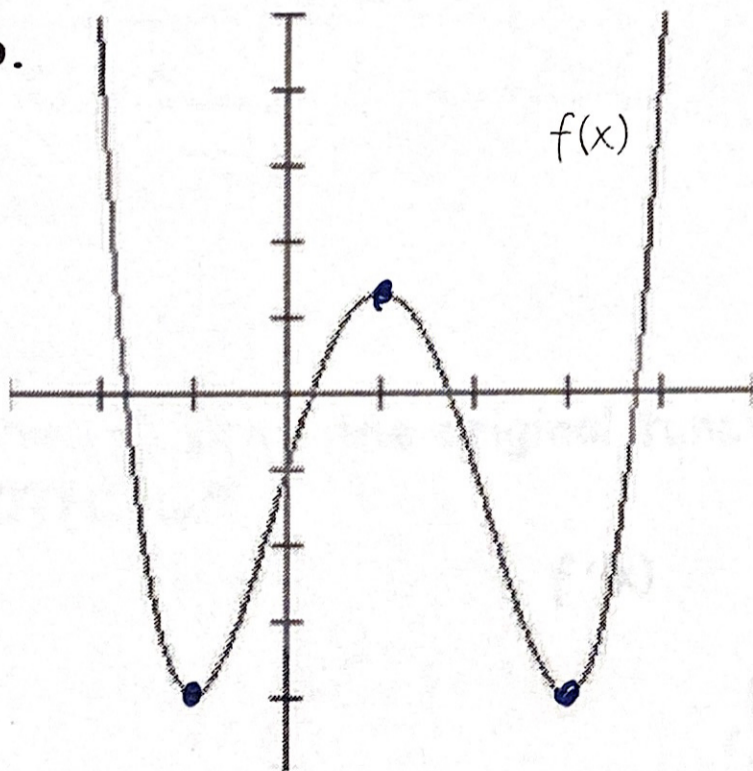
14.



15.

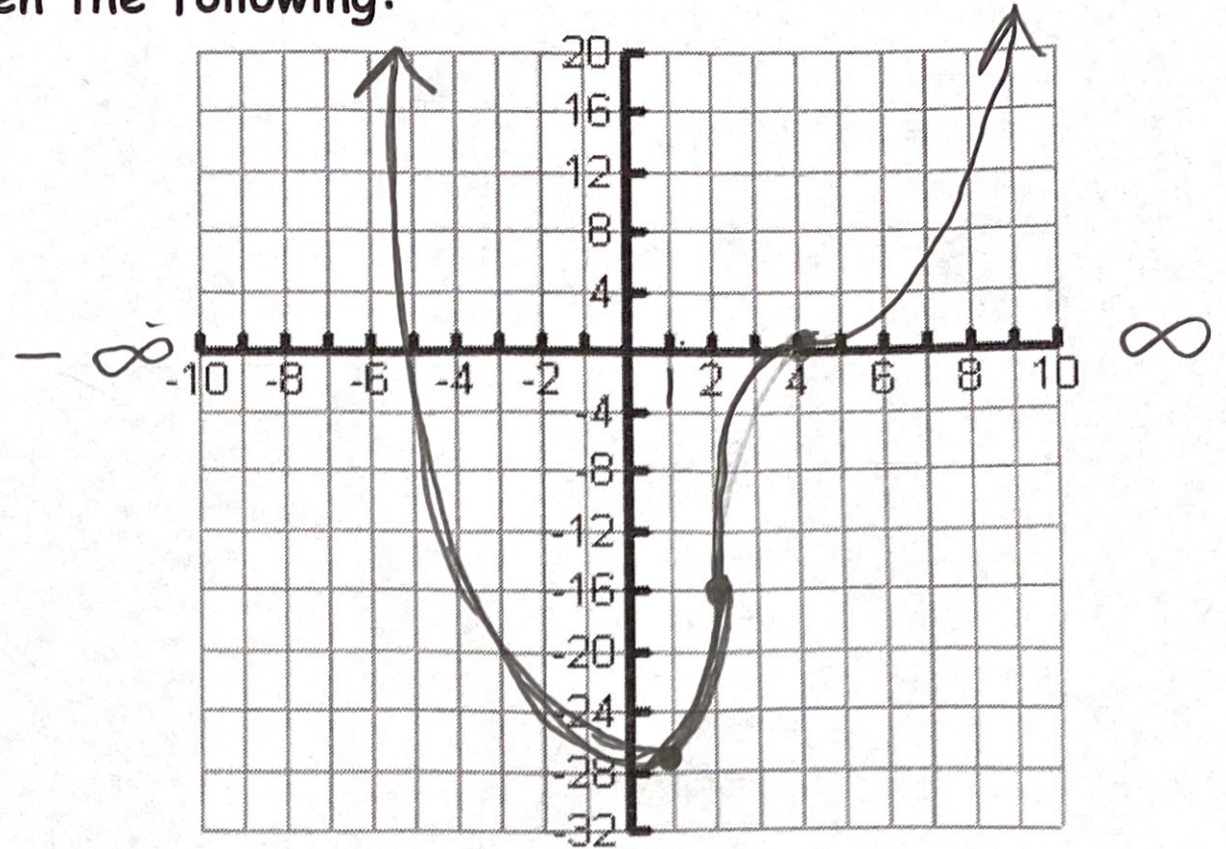


16.

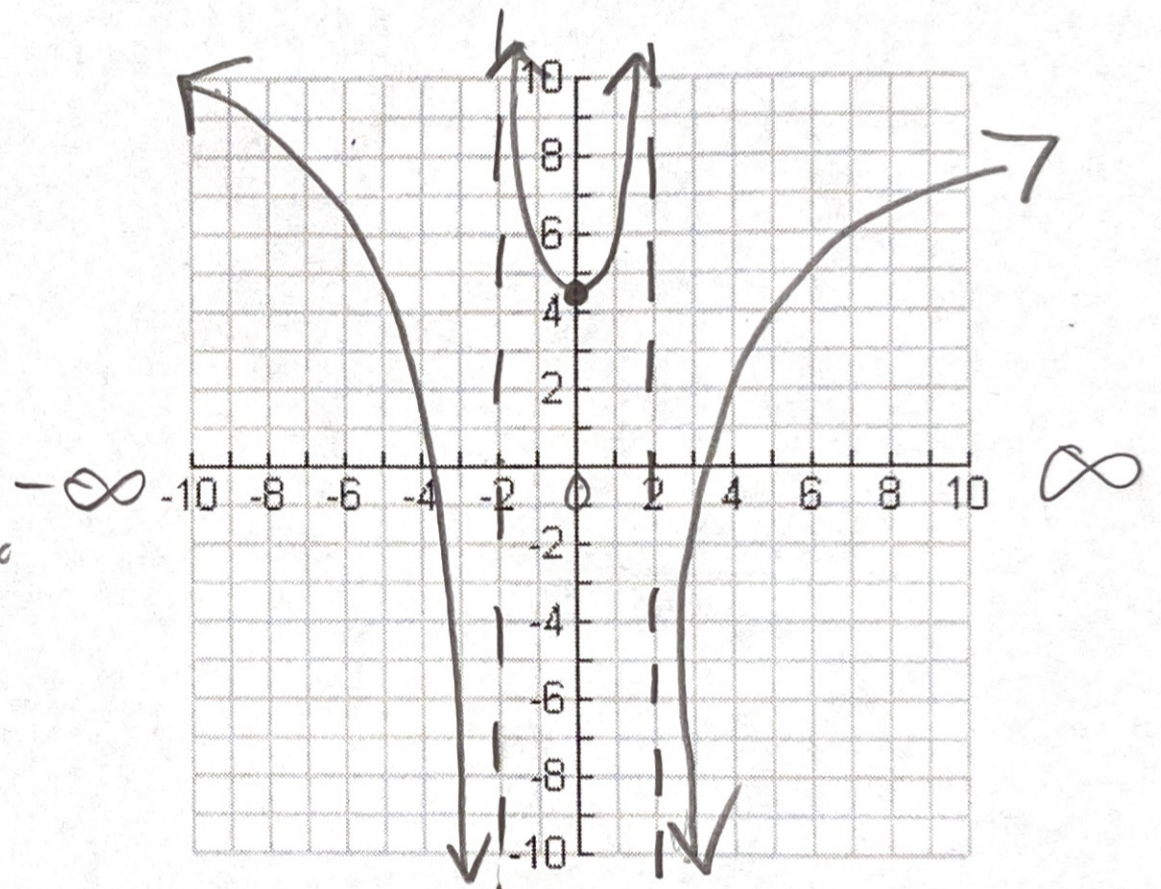


17-18. Sketch the graph of the function given the following:

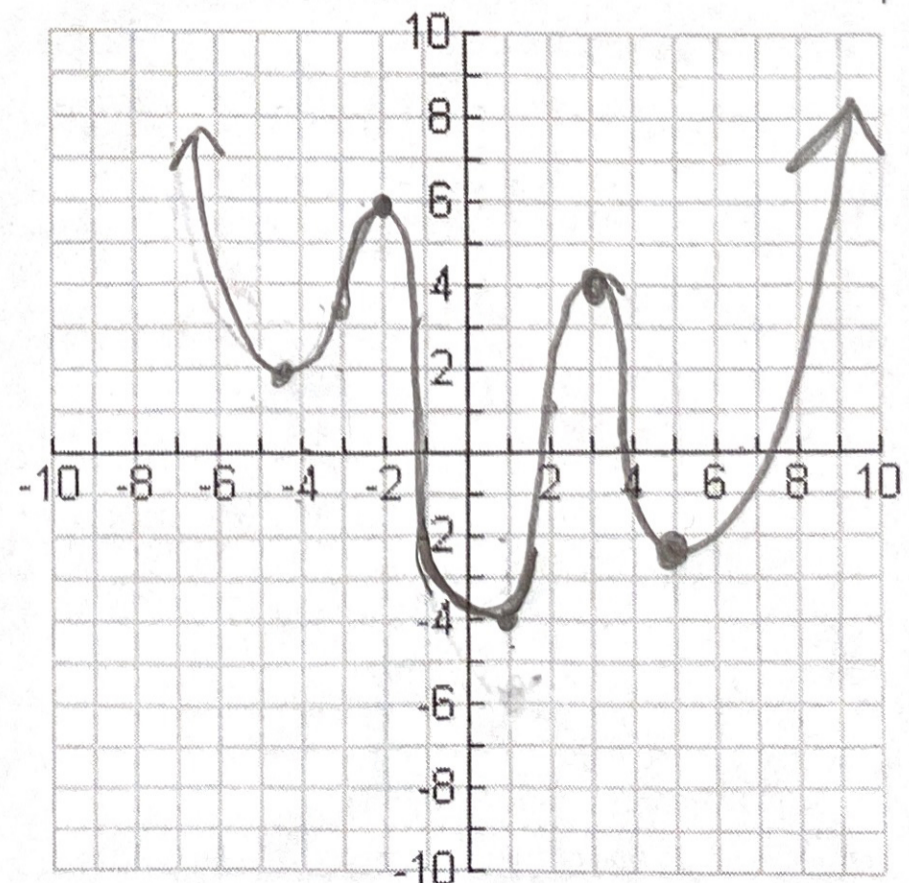
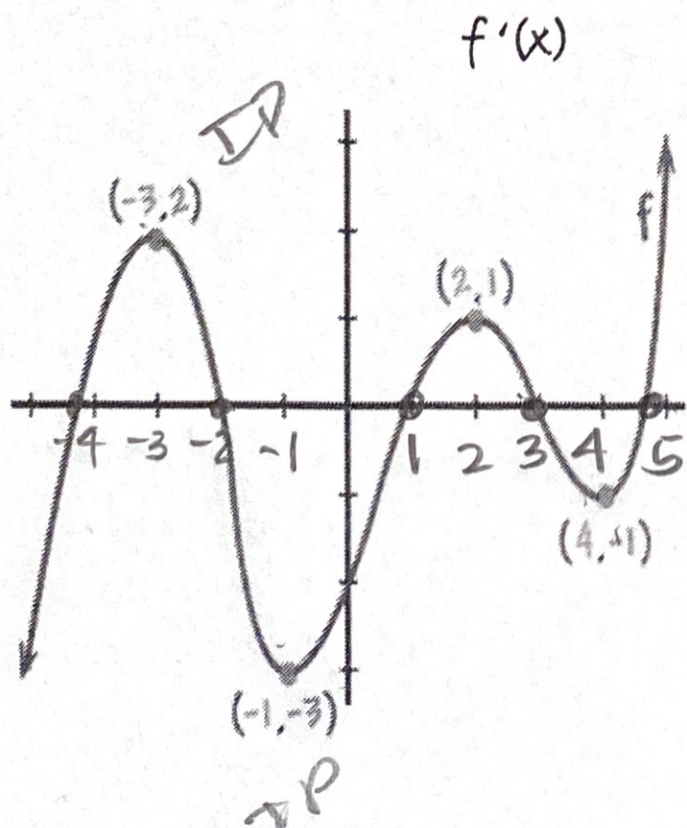
#17.	F(x)	F'(x)	F''(x)
$-\infty < x < 1$		Negative <i>dec</i>	Positive <i>cu</i>
$x = 1$	-27	0	Positive
$1 < x < 2$		Positive <i>inc</i>	Positive <i>cu</i>
$x = 2$	-16	Positive <i>inc</i>	0
$2 < x < 4$		Positive <i>inc</i>	Negative <i>cd</i>
$x = 4$	0	0 <i>cr+ value</i>	0
$4 < x < \infty$		Positive <i>inc</i>	Positive <i>cu</i>



#18.	F(x)	F'(x)	F''(x)
$-\infty < x < -2$		Negative <i>dec</i>	Negative <i>cd</i>
$x = -2$	Undefined	Undefined	Undefined
$-2 < x < 0$		Negative <i>dec</i>	Positive <i>cu</i>
$x = 0$	4.5	0	Positive <i>cu</i> <i>r max</i>
$0 < x < 2$		Positive <i>inc</i>	Positive <i>cu</i>
$x = 2$	Undefined	Undefined	Undefined
$2 < x < \infty$		Positive <i>inc</i>	Negative <i>cd</i>



Bonus: +5 Draw the original function given the first derivative function. ALL OR NOTHING!!!



$f'(x)$