

Derivative Information Chart

Assume that f , f' and f'' are all nice continuous functions

If we know:	Then we know the following about: <i>the graph of f</i>	<i>the function f' and the f' graph</i>	<i>the function f'' and f'' graph</i>
$f > 0$ on interval (a,b)	The f graph is:		
$f < 0$ on interval (a,b)	The f graph is:		
$f = 0$ at $x = a$	(what happens to the f graph?)		
f is increasing on interval (a,b)	If $a < x_1 < x_2 < b$, then:		
f is decreasing on interval (a,b)	If $a < x_1 < x_2 < b$, then:		
f has an extreme point at $x = a$	the f graph locally looks like:		
f is concave up on interval (a,b)	the tangent lines for the f graph lie:		
f is concave down on interval (a,b)	the tangent lines for the f graph lie:		
f has an inflection point at $x = a$	the tangent line for the f graph at $x = a$ does what?		

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If we know:	Then we know the following about: <i>the function f and the f' graph</i>	<i>the f' graph</i>	<i>the function f'' and f'' graph</i>
$f' > 0$ on interval (a,b)		The f' graph is:	
$f' < 0$ on interval (a,b)		The f' graph is:	
$f' = 0$ at $x = a$		(what happens to the f' graph?)	
f' is increasing on interval (a,b)		If $a < x_1 < x_2 < b$, then:	
f' is decreasing on interval (a,b)		If $a < x_1 < x_2 < b$, then:	
f' has an extreme point at $x = a$		the f' graph locally looks like:	
f' is concave up on interval (a,b)		the tangent lines for the f' graph lie:	
f' is concave down on interval (a,b)		the tangent lines for the f' graph lie:	
f' has an inflection point at $x = a$		the tangent line for the f' graph at $x = a$ does what?	

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If we know:	Then we know the following about:		
	<i>the function f and the f graph</i>	<i>the function f' and the f' graph</i>	<i>the f'' graph</i>
$f'' > 0$ on interval (a,b)			The f'' graph is:
$f'' < 0$ on interval (a,b)			The f'' graph is:
$f'' = 0$ at $x = a$			(what happens to the f'' graph?)
f'' is increasing on interval (a,b)			If $a < x_1 < x_2 < b$, then:
f'' is decreasing on interval (a,b)			If $a < x_1 < x_2 < b$, then:
f'' has an extreme point at $x = a$			the f'' graph locally looks like:
f'' is concave up on interval (a,b)			the tangent lines for the f' graph lie:
f'' is concave down on interval (a,b)			the tangent lines for the f'' graph lie:
f'' has an inflection point at $x = a$			the tangent line for the f'' graph at $x = a$ does what?