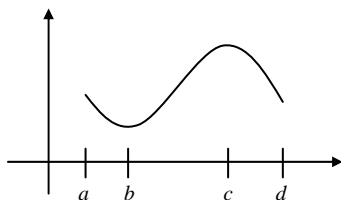


**AP Calculus AB Review for Chapter 3.6 – 4.4 EXAM**

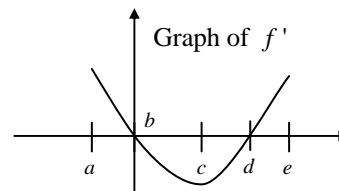
- Find  $(f^{-1})'(2)$  if  $f(x) = x^3 + 2x - 1$ .
- Find the value of  $c$  guaranteed by the MVT for  $f(x) = \sin x$  on the interval  $[4, 5]$  ... WITH CALCULATOR
- Find the value of  $c$  guaranteed by the MVT for  $f(x) = 4x^2 + 5x$  on the interval  $[-2, 1]$
- Given  $y = x^3 - 3x$ , find the following about the function AND sketch a graph.
  - zero(s)
  - intervals where the function is increasing/decreasing
  - Maximum/Minimums
  - intervals where the function is Concave Up/Concave Down/Points of Inflection
- Given  $a(t) = 5$ , find  $v(t)$  and  $s(t)$ , if  $v(2) = 10$  and  $s(0) = 5$ .
- Find the following derivatives
 

a) $y = \sin^{-1}(x^2)$	b) $y = \tan^{-1}(\sin x)$	c) $\sec^{-1}(\sqrt{x})$	d) $e^{-x^2}$
e) $5^{x^2+5}$	f) $y = \log_4(\sin^{-1}(2x))$	g) $(\sin x)^{e^x}$	
- If  $y'' = x^3 - 4x^2$ , where is the function concave up, concave down, point of inflection?

8. What are the signs of  $g'(x)$ ,  $g''(x)$  at each point. Explain your reasoning.



9. Given the graph of  $f'$ , when is the function increasing, decreasing, concave up, and concave down? Where does the function have a maximum? Where does the function have a minimum? Justify your responses.



- Find  $y'$  for each function.
  - $y = 3^{\sin x}$
  - $y = e^{\ln x}$
- Where do extrema occur? How do you determine whether or not the extrema is a maximum or minimum? What's the difference between absolute and relative extrema?
- Find  $\frac{dy}{dx}$  if  $x^2 y + 3y^2 = x$ .
- Find  $y'''(x)$  if  $y = (4x+1)^7$
- Find the maximum area of a rectangle inscribed under the curve  $h(x) = \sqrt{25 - x^2}$
- If the derivative of the function is given by  $g'(x) = 2\cos(x - \frac{\pi}{6}) + 1$  on  $[-2\pi, 2\pi]$ , when is  $y$  increasing, decreasing, concave up, concave down? Where is the maximum(s), minimum(s), and point(s) of inflection? Use your calculator and the graph of the derivative to justify your responses to ALL answers.