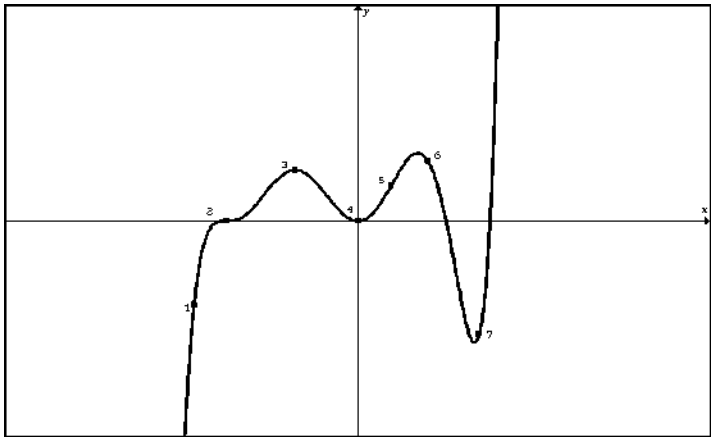
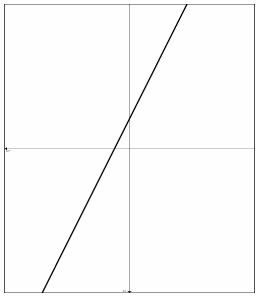
Quiz Meaning of Derivatives 2019 A.doc **Name:**

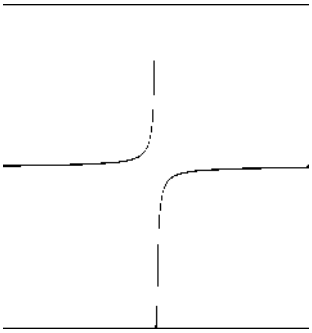
Introduction to Calculus

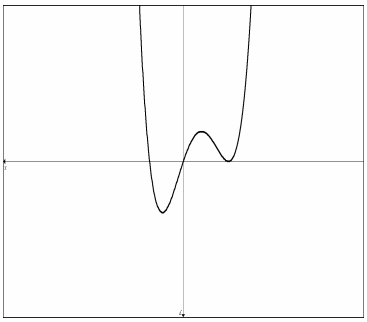
1. Given the function f(x) below, indicate if f(x), f′(x), and f″(x) are positive, negative, or zero at each point.

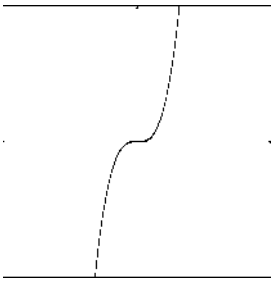


2. Sketch the first derivative of each of the following functions.







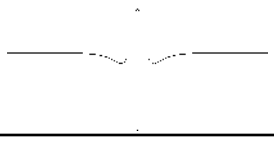


3) Find the derivative of f(x) below using the limit definition of the derivative,

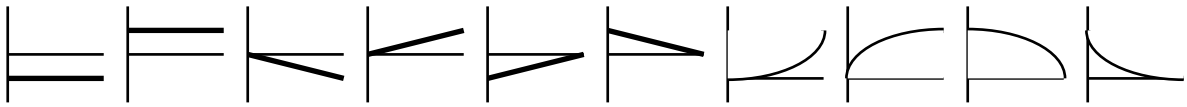
$$f'(x)=\lim_{h\to 0}\frac{f(x+h)-f(x)}{h} \qquad f(x)=x^2-3x+7$$

4) Which of the functions below are the first and second derivatives of function f(x) below?

f(x) →  f′(x) = _____ f′′(x) = _____

(1)	(2)	(3)	(4)
			

Questions 5 & 6 refer to the graphs below.



(1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

5) In an experiment, the temperature, f(t), of a liquid is measured every minute for 10 minutes. Assume temperature is a function of time, t. Each minute during the experiment the temperature is decreasing by less than it did the previous minute.

_____ a) Which graph above best represents f(t)?

_____ b) Which graph above best represents f′(t)?

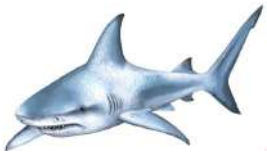
_____ c) Which graph above best represents f′′(t)?

_____ d) What are the units of f′?

(1) minutes per degree (3) degrees
(2) degrees per minute (4) degrees per minute per minute

6) Sharks continue to grow larger throughout their entire lives; however, their rate of growth slows as they get older. Length, f(x), is a function of age,x.

_____ a) Which graph above best represents f(x)?



_____ b) Which is true about f′′(x)?

(1) f′′(x)>0 (2) f′′(x)<0 (3) f′′(x)=0

c) Use function notation to write the following:

_____A 16 foot shark is 12 years old.

_____An "**a**" year old shark's growth is slowing at a rate of "**b**".