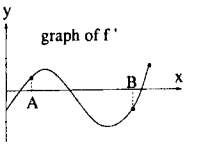
Name:_____ Section:_____

Directions: Please read each question carefully. Solution methods must be complete, logical and understandable, answers must be clearly labeled and explanations must be clearly written in the space provided. Calculators are allowed but you must show all your work to receive full credit on a problem.

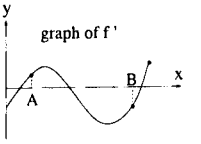
(10 pts) For each part, if the statement is always true, circle the printed capital T. If the statement is sometimes false, circle the printed capital F. In each case, write a **complete sentence** justifying your answer.



(a) Given the graph of f' as shown, f is increasing at the point B. (a) T (F)

Write a sentence justifying your answer:

$f'(B) < 0 \Rightarrow f$ is decreasing



(b) Given the graph of f' as shown, f is concave up at the point A. (a) (T) F

Write a sentence justifying your answer:

f' is increasing at $A \Rightarrow f'' > 0$ at A

(c) If $f'(x) > 0$ for all x in the interval (a,b), then f is increasing on the interval (a,b). (c) (T) F

Write a sentence justifying your answer:

$f' > 0$ means the rate of change of f is always positive, i.e. f is increasing

(d) If a function is not continuous at a point, then it is not defined at that point. (d) T (F)

Write a sentence justifying your answer:

Consider $f(x) = \begin{cases} 1 & x \le 0 \\ -1 & x > 0 \end{cases}$ then f is not continuous at 0, but it's defined at 0.

(e) If a function f is decreasing on an interval, then f' is decreasing on that interval. (e) T (F)

Write a sentence justifying your answer:

Consider $f(x) = x^2$ for $-2 \le x \le 0$

then f is decreasing but $f' = 2x$ is increasing.