DATE: _____

Intermediate Value Theorem

For #1 & 2, write TRUE or FALSE. If FALSE, explain why.

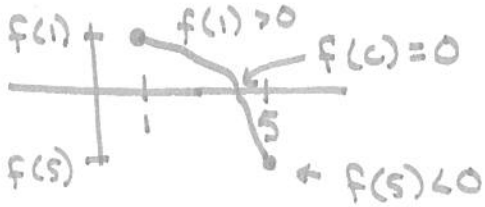
1. If $f(1) < 0$ and $f(5) > 0$, then there must be a number c in the interval $(1,5)$ such that $f(c) = 0$.

↳ part of IVT, but not stated if $f(x)$ is continuous.

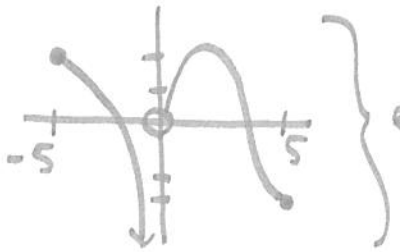
so, FALSE

2. If f is continuous on $[1,5]$, $f(1) > 0$ and $f(5) < 0$, then there must be a number c in $(1,5)$ such that $f(c) = 0$.

TRUE, IVT states if f cont on [1,5] and



3. Suppose that f is defined on $[-5,5]$, that $f(-5) = 2$ and $f(5) = -2$. If f assumes every value in $[-2,2]$, must f be continuous? Explain.
[*HINT*: The answer is NO. Draw a graphical example to illustrate this.]



every y-value is covered, but f is not cont.

AP Calculus AB – 2006 Free-Response Calculator

t (sec)	0	15	25	30	35	50	60
$v(t)$ (ft/sec)	-20	-30	-20	-14	-10	0	10
$a(t)$ (ft/sec^2)	1	5	2	1	2	4	2

1. A car travels on a straight track. During the time interval $0 \le t \le 60$ seconds, the car's velocity, v, measured in feet per second, and acceleration, a, measured in feet per second per second, are continuous functions. The table above shows selected values of these functions.

(c) For $0 < t < 60$, must there be a time t when $v(t) = -5$? Justify your answer.

Since $v(t)$ is continuous (stated in problem)
and $v(35) < -5$ and $v(50) > -5$, then
$\exists$ some time t on $[0,60]$ s.t. ~~f(c)~~ $v(t) = -5$,

(IVT)