1.) <u>Continuity</u> <u>@</u> <u>a</u> <u>point</u>

A function is continuous @ a pt $x=c$ if the following three conditions are met:

1. $f(c)$ is defined
2. $\lim_{x \to c} f(x)$ exists
3. $\lim_{x \to c} f(x) = f(c)$.

Students: write this in words.

2. Continuous on Open interval (a,b) if continuous at each point in the interval.

3. Everywhere continuous $\Longleftrightarrow$ cont. on $(-\infty,\infty)$.

Continuity of a function:

* all polynomials are everywhere continuous.

* Rational expressions & ~~trig~~ trig continuous [ON THEIR DOMAIN*]
    * exclude zeros in denominator
* Radical
* Piecewise defined functions are cont. for each polynomial & must be checked at the Break, / Jump point.

  Y values must = for both functions.

Properties of continuity

b & c real #s, f + g continuous functions

- scalar multiple bf continuous
- ~~sum~~ & difference $f \pm g$ continuous
- product $f \cdot g$ continuous
- quotient $\frac{f}{g}$ $g \neq 0$. continuous

Continuity of Compositions

g cont @ c, f cont @ $g(c)$

then $f(g(x))$ cont. @ c.

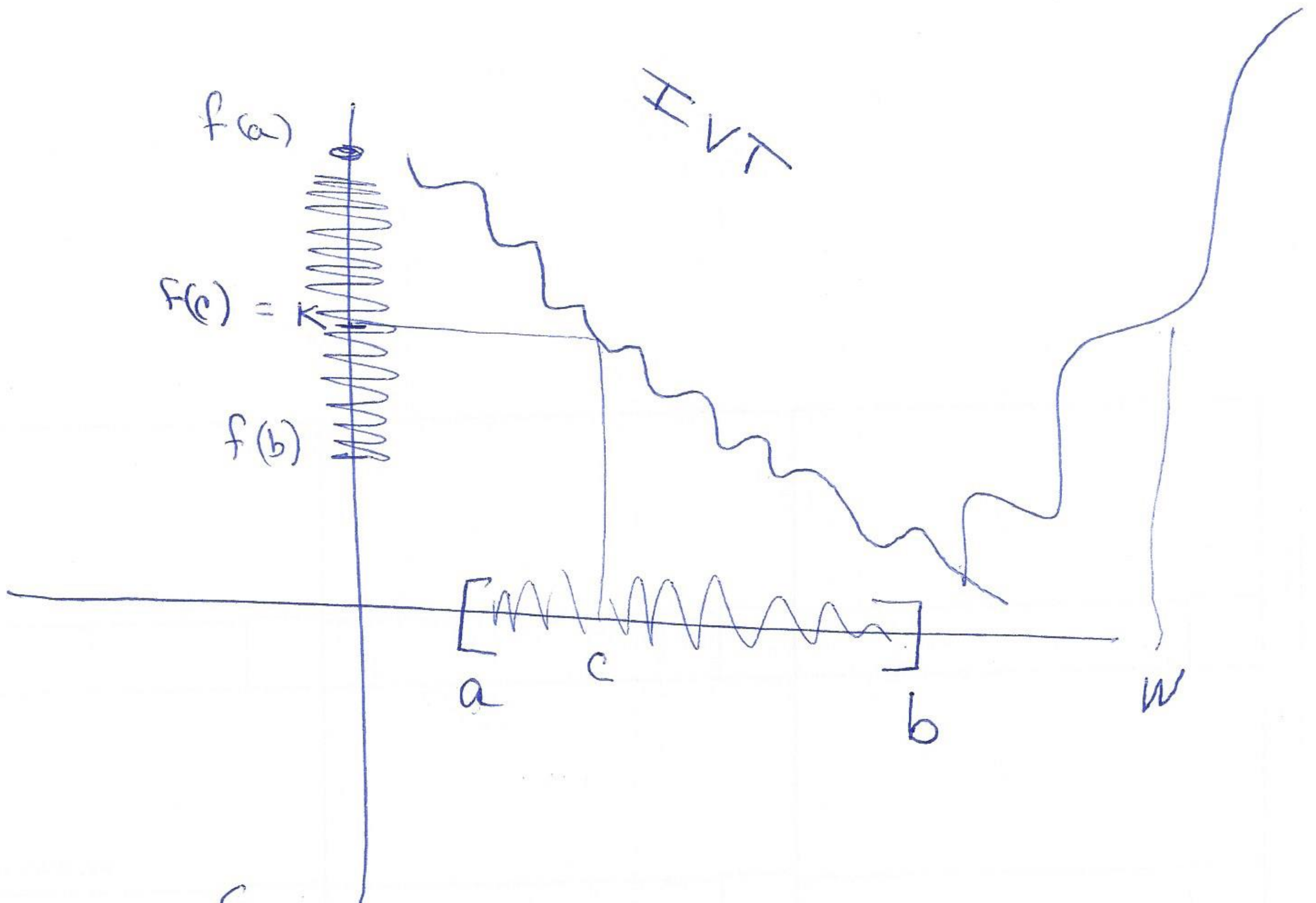
IVT:

If f cont. on $[a,b]$ and

k any number btwn $f(a)$ & $f(b)$

then $\exists$ c in (a,b) so that

$f(c) = k$.



for any k in (f(a), f(b))
there is a c in (a,b)
where f(c) = k.