C12 - 1.9 - Limit IVT Notes

$f(x) = x^2 - 3$

$(1.73, 0)$

IVT

$x^2 = 3$?

$f(x) = x^2 - 3 = 0$

	x	
	0	-3
a	1	-2
c	1.73	0
b	2	1

$+ \to -$
OR
$- \to +$

$f(a) \le f(c) \le f(b)$
$f(1) \le f(c) \le f(2)$
$-2 \le 0 \le 1$

This should be obvious to you!
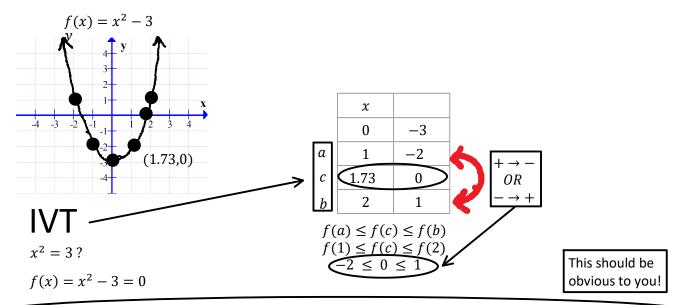
There is a value $x = c$ between a and b ; where $f(x) = 0$, & Continuous therefor $x^2 = 3$ must have a solution.

Use the intermediate value theorem to prove there is a solution for x, v & a.

$0 = x^2 - 2x - 3 \quad ; [2,4]$

$x^2 = 2x + 3 \quad ; [-2,0]$

t (s)	$v \left(\dfrac{m}{s}\right)$	$a \left(\dfrac{m}{s^2}\right)$
0	-5	-2
1	-2	2
2	3	6
3	5	5
4	9	6