MAT 122 2/2

Practice

① Does $\arctan(x-1) = \frac{\pi}{2}\frac{x}{x+3}$ have a positive solution?

Put $f(x) = \arctan(x-1) - \frac{\pi}{2}\frac{x}{x+3}$. Does $f(x)=0$ have a positive solution?

$f(1) = 0 - \frac{\pi}{2}\frac{1}{4} < 0$

$f(2) = \frac{\pi}{4} - \frac{\pi}{2}\frac{2}{5} > 0$

0 is between $f(1)$ and $f(2)$. Therefore, by the IVT, $f(x)=0$ has a solution in $[1,2]$

② Does x^2-4x+2 have an x-int in the interval $[0,2]$?
How about $\frac{2x-5}{x-1}$?

Limits

What does $\frac{f(x)}{\frac{\ln(x)}{x-1}}$ look like near $x=1$?

x	f(x)
2	
1.5	
1.1	
1.01	
1.001	
1.0001	

x	f(x)
0.5	
0.9	
0.99	
0.999	
0.9999