CS 3010.02 | class exercise 3.2 and 3.3

Christopher Koepke

1. F	ind the	two positi	ve roofs u	sing the N	ewton Rapson Method for	
9	$(X) = X^{7}$	$-2x^3-7x^2+$	Two positive roots using the Newton Rapson Method for $2x^3 - 7x^2 + 3$ . $g'(x) = 4x^3 + 6x^2 - 14x$ $x_{nH} = x_n - \frac{f(x_n)}{f'(x_n)}$ $f(x_n) \qquad f'(x_n) \qquad X_{nH} \qquad \text{approx, error} = \frac{ X_{nH} - X_n }{ X_{n+1} }$ $-1 \qquad -4 \qquad 3/4 \qquad \frac{1}{3}$ $57/356 \qquad -87/16 \qquad 367/464 \qquad 19/367$ $0.0018132801 \qquad -5.3040414956 \qquad 0.7412401435 \qquad 4.320383 \times 10^{-4}$ $5 \qquad -1,22594,10^{-5} \qquad -5.33939 \qquad 0.7412479282 \qquad -2.74961304 \times 10^{-6} \times cond$			
h	×'n	f(xn)	f'(xn)	Xnrı	approx, error = $\frac{ X_{n+1} - X_n }{ X_{n+1} }$	
0			-4	3/4	- <u>1</u> 3	
51 new Staffel Staffel (September 1990 a staffel et al.	3/4	57/256	-87/16	367/464	19/367	
£	367,469	0.0018/32801	-5.3040414456	] 0.7912901435	4,320383 × 10 -4	
3	0.79124014.	35 -1,22599x10	9-5 -5,33939	0.7912279232	2.79961304 x 10-6 * round error	
		•				

Degree Designation of the Control of	The state of the s		X		
N.	×n	$P(x_n)$	$f'(x_n)$	Xn+1	approx. error
0	ے	7	28	7/4	1/7
1	7/4	425/256	245/16	1227/784	35/1287
2	1287/784	0.2457991091	10,88147144	1.618992358	0.0139523621
3	1.612992858	0-0096056336	10.03534123		5.91569 x 10-4

Two positive roots:

X ≈ 0.7912 and X ≈ 1.6181

2. Use the secant method to find the root for  $f(x) = x^5 + x^3 + 3$  given  $x_0 = 1$  and  $x_1 = -1$ , go up to 8 interations.

$$\chi_{n+1} = \chi_n - \left[ \frac{\chi_n - \chi_{n-1}}{\ell(\chi_n) - \ell(\chi_{n-1})} \right] \cdot \ell(\chi_n)$$

 $\frac{\text{approx.}}{\text{error}} = \frac{|X_n - X_{n-1}|}{|X_n|}$ 

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x≈-1.105298546	4	1007	Punction	
Transform Annual Control Annual Control Annual Control Control Control Control Control Control Control Control				

(N)	7	6	N	4	W	2	_	2
-1.105298546	7 -1.105295849	6-1.105203327	5 -1.106927224	4 -1.084647581	303	e ju		X
-1.105298546 -1.105295849 -1.105298546 6,87 x 10-11	-1.105203327	-1.106927224	-1.084647581	287	Section (1994) (Section in the contract of the			Xn-1
-1,105298546	-1.105a033a7 -1.105a98546	-1.105395849 0.0010594088	-1.105203327	-1.10692722Y	-1.084647581	-303 387	2/4	Xn+1
	3.00111492×10-5	0.0010594088	-0.018679883	0,2227588388	0.511648653	-255/32		P(X <sub>n</sub> )
3.001111492×10-5	0.0010594028	-0.0)8679883	0.222 73.883.88	0.511648653	333			$\mathcal{P}(X_{n+1})$
=	6.87×10-11	3,00111492 × 10-5 -0.0015598008	C89172 E10E0.0 8804650100.0	-0.0181679883	0.2273888	0,511648653	- 255/32	P(Xn+1)
2.44006.4733×10	8.3707905x10-5	-0.0015598008	0.0201274687	0.036643172	202	The state of the s	2	error