Problem Set 3

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1 9.10

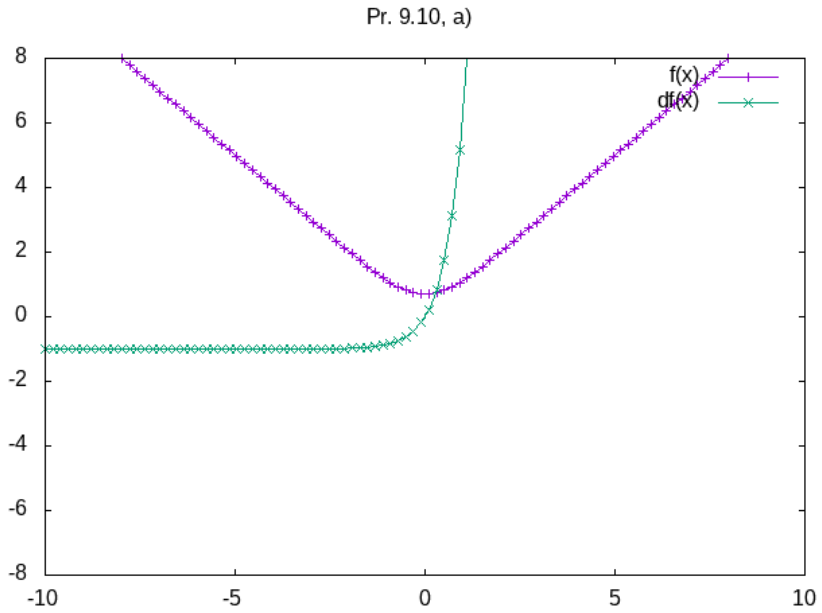
1.1 a) $f(x) = \log(e^x + e^{-x})$

The first 5 iterations of *Newton* starting $x^{(0)} = 1.1$:

x	f(x) - p*$
1.1	0.5119361392087508
-1.1285525852679466	0.534936662546477
1.234131133039099	0.6223168792455797
-1.6951659799227943	1.035160968649203
5.71536010037962	5.022223776547119

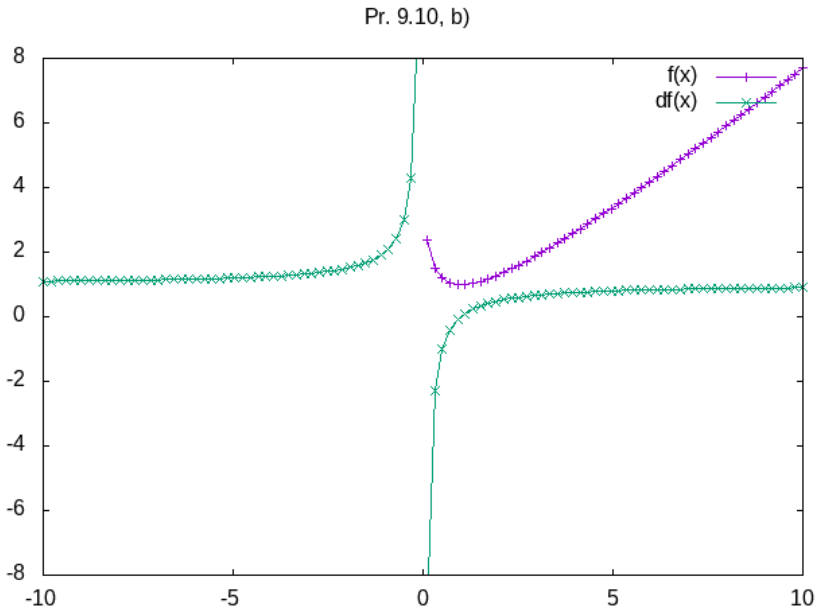
The first 5 iterations of *Newton* starting $x^{(0)} = 1.0$:

x	$f(x) - p*$
1	0.4337808304830272
-0.8134302039235093	0.2997218287983928
0.40940231658338555	0.08156361618530006
-0.047304916455615575	0.0011184605136171921
7.060280364459826 (-05)	2.492377859653061 (-09)



1.2 b) $f(x) = -\log(x) + x$

The first step puts us at x = -3, which $f(x)$ is undefined on.


Pr. 9.10, b)
f(x)
df(x)
8
6
4
2
0
-2
-4
-6
-8
-10
-5
0
5
10