

Programming the TI-83/84 Plus NM

Note Title

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Here is a quick little program that makes doing Newton's Method painless.

Recall that Newton's Method requires the function, its derivative, and a starting value.

$$X_{n+1} = X_n - \frac{f(x_n)}{f'(x_n)}$$

We put $f(x)$ into y_1 ,
 We put $f'(x)$ into y_2
 We put x_1 into A .
 Then we use NM to iterate as many times as required

```

0 PROGRAM:NM
1 :A-Y1(A)/Y2(A)
2 :Ans→A
3 :Disp A
  
```



eg) Find $\sqrt[6]{2}$ using Newton's Method to 3 decimals.

So $f(x) = x^6 - 2$ & $f'(x) = 6x^5$

$$X_{n+1} = X_n - \frac{X_n^6 - 2}{6X_n^5}$$

Plot1	Plot2	Plot3
$Y_1 = X^6 - 2$		$f(x)$
$Y_2 = 6X^5$		$f'(x)$
$Y_3 =$		
$Y_4 =$		
$Y_5 =$		
$Y_6 =$		
$Y_7 =$		

```

1→A
PrgmNM
1.166666667
Done
1.126443678
Done
1.122497067
Done
1.122462051
Done
1.122462048
Done
1.122462048
Done
  
```

We can see that it doesn't take many iterations before it converges to the result.