

implicit_differentiation_on_the_ti89

$\frac{dy}{dx} = -\frac{F_x}{F_y}$ where F_x and F_y are the partial derivatives of $F(x, y)$ can be easily processed by the TI-89.

Press
 APPS
 then
 8:Text Editor
 then
 3:New
 type in
 imp
 as the variable name and press
 ENTER
 twice.

Press
 F2
 and select
 1:Command.
 Then press
 2nd MATH
 and select
 A:Calculus
 and then
 1:d(differentiate.

Then enter
 -f,x)/ (smallnegative ef comma x parenthesis divide)
 Then press
 2nd MATH
 and select
 A:Calculus
 and then
 1:d(differentiate.
 Then enter
 f,y) (ef comma y parenthesis)

You are **done**...press 2nd quit

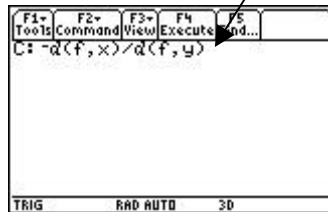
To use it, set the equation equal to zero as $F(x, y) = 0$
 And store it in f.

Press
 APPS
 then
 8:Text Editor
 then
 1:Current
 press
 F4

To execute the command
 and then
 2nd QUIT
 to view your answer dy/dx

Note:
 $w = F(x, y) = 0$
 $dw/dx = F_x dx/dx + F_y dy/dx = 0$
 $F_x \cdot 1 + F_y dy/dx = 0$
 $dy/dx = -F_x / F_y$

The below may also be typed from the home screen after storing $F(x, y)$ in f. (when doing it from the home screen, do not type in the C:)



Ex) Find dy/dx for $e^{xy} - e^x = -e^{2y}$
 $F(x, y) = e^{xy} - e^x + e^{2y} = 0$
 Store in f as below.
 $e^{xy} - e^x + e^{2y} \rightarrow f$

