Matching functions with their first and second derivatives.

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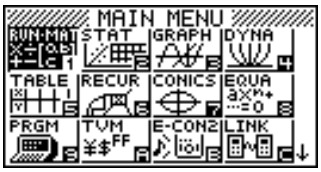
Numerical checking

Select RUN mode from the **MAIN MENU** by using the arrow keys to highlight the RUN icon or pressing 1.



Checking that you have differentiated correctly, the 'calculator logic' will return a 0 if incorrectly done or a 1 if correctly done. As the FX9750GII (and earlier models) are 'numerical manipulators' and **NOT** 'symbolic manipulators'. The student **MUST** know how to **differentiate,** i.e. **d/dx(f(x))** or **integrate** i.e. $\int$**f(x)*dx***.

OPTN then **F4** followed by either **F2** or **F3** or **F4** for the '**calculus tools**'.

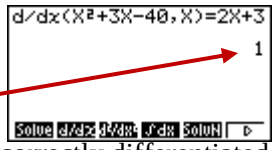
Note: y´ (or $^{dy}/_{dx}$) and y″ (or d^2y/dx^2) are the same as f´(*x*) and f ″(*x*) respectively.

Example 1:

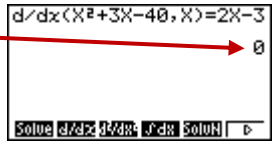
Differentiate $y = x^2 + 3x - 40$

Checked answer: Enter in the equation in the form as shown.

Press **EXE** The result is a '1' and indicates that it is correctly differentiated.



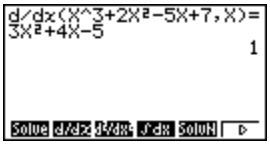
If incorrectly differentiated, the result displayed is a '0'.

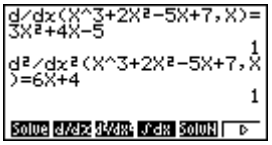


Example 2:

Differentiate f(x) = $x^3 + 2x^2 - 5x + 7$ to find f´(x) and f ″(x).

Checked answer:

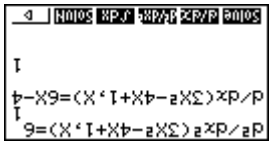


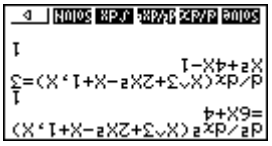


Try these: Differentiate *y* to find y´ (or $^{dy}/_{dx}$) and y´´ (or d^2y/dx^2)

1. $y = 3x^2 - 4x + 1$
2. $y = x^3 + 2x^2 - 6x + 1$

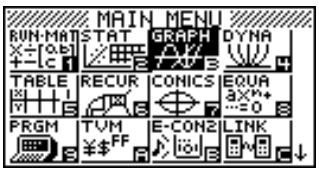
Answers:

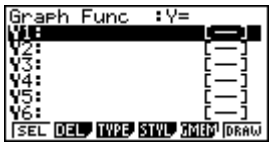


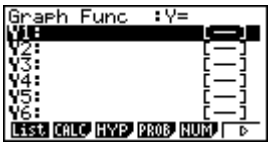


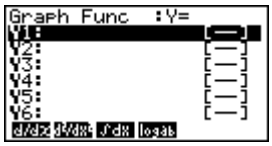
Graphical matching of functions and derivatives

Select GRAPH mode from the **MAIN MENU** by using the arrow keys to highlight the GRAPH icon or pressing 3.





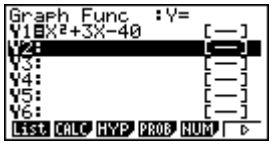




OPTN then **F2** followed by either **F1** or **F2** or **F3** for the '**calculus tools**'.

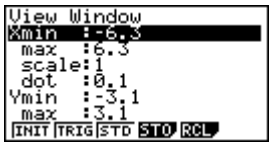
Example 1:

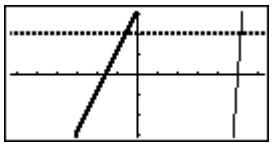
Illustrate $y = x^2 + 3x - 40$ and its associated f´(x) and f´´(x) graphs.

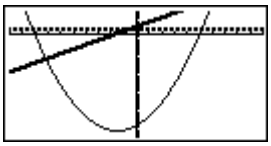


Enter $y = x^2 + 3x - 40$ in Y1. Enter the first derivative in Y2. Enter the first derivative in Y3.

Set up the View Window. Draw. Adjust as necessary… Redraw.

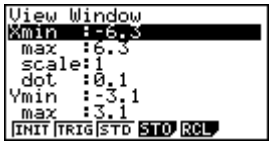


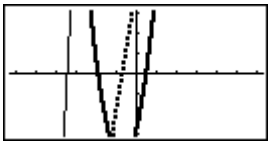


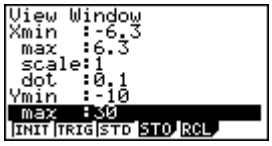


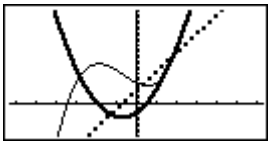
Example 2:

Differentiate f(x) = $x^3 + 2x^2 - 3x + 7$ and its associated f´(x) and f ″(x) graphs.









Note:

Where does f´(x) = 0 align with f(x)?

What about where f´(x) > 0 or f´(x) < 0 ?

Where does f ″(x) = 0 align with f(x) and f´(x)?

What about where f ″(x) > 0 or f ″(x) < 0?