2.7 Composite functions

2.7.1 Graph the composition of two functions

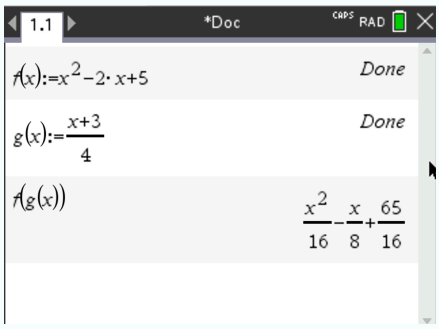
Suppose you want graph $(f \circ g)(x)$ for the following functions:

$$f(x) = x^2 - 2x + 5, \qquad g(x) = \frac{x+3}{4}.$$

① Create a new document, press menu and select Add Calculator.

② Enter the two expressions $f(x)$ and $g(x)$, each in a different line. To do this, write '**f(x)**' and press ctrl then . Then, write the expression function of x. Do the same for $g(x)$.

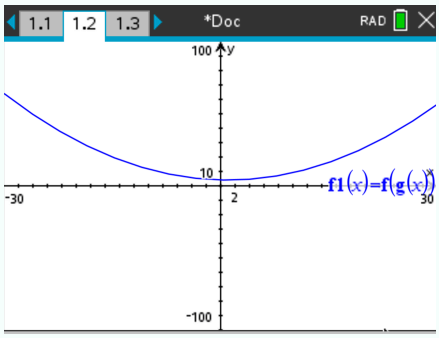
③ Write '**f(g(x))**' in a third line and press enter. The result is displayed:



④ To plot the function, open a new page by pressing ctrl then . Select Add Graphs.

⑤ Write '**f1(x)=f(g(x))**' and press enter.

⑥ Choose an appropriate window. To do that, press menu and select Window /Zoom > Window Settings. Enter the appropriate values of Xmin, Xmax, Ymin and Ymax. The following graph should be displayed (with **Xmin=-30**, **Xmax=30**, **Ymin=-100**, **Ymax=100**):



2.7.2 Compute specific value of the composition of two functions

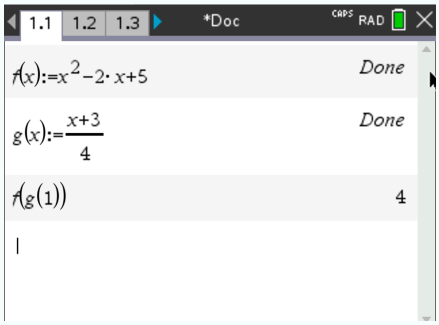
Suppose you want to evaluate $(f \circ g)(1)$ for the following functions:

$$f(x) = x^2 - 2x + 5 \qquad\qquad g(x) = \frac{x+3}{4}.$$

① Create a new document, press menu and select Add Calculator.

② Enter the two expressions $f(x)$ and $g(x)$, each in a different line. To do this, write '**f(x)**' and press ctrl then ⋮. Then, write the expression function of x. Do the same for $g(x)$.

③ Write '**f(g(1))**' in a third line and press enter. The result is displayed:



The result should be 4. Thus $(f \circ g)(1)$ =4.