






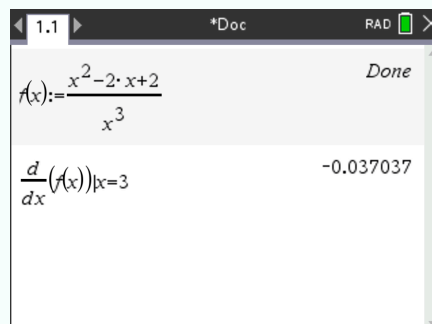
## 5.3 Derivative of a function

### 5.3.1 Compute the derivative of a function at a point

Suppose you want to evaluate  $\frac{df}{dx}$  at  $x = 3$  of the following function:

$$f(x) = \frac{x^2 - 2x + 2}{x^3}$$

- ① Create a new document, select Add Calculator.
- ② Enter 'f(x)', press  then . Write the expression of the function.
- ③ Press  and select Calculus > Derivative at a Point.
- ④ Enter x as the Variable and 3 as the Value. Press . Write 'f(x)' inside the brackets. Press .






The result should be  $-0.0370$  (rounded). Thus,  $f'(3) = -0.037$ .

### 5.3.2 Graph the derivative of a function

Suppose you want to draw the graph of  $\frac{df}{dx}$  of the following function:

$$f(x) = \frac{x^2 - 2x + 2}{x^3}$$

- ① Create a new document, select Add Calculator.
- ② Enter 'f(x)', press  then . Write the expression of the function. Press .

- ③ In the following line, write 'fd(x)'. Press **ctrl** and **⏏** to define the function. Then press **☰**, select Calculus > Derivative. Write 'f(x)' inside the brackets. Press **⏏**. The derivative is displayed

The calculator screen shows the following:
   
Line 1:  $f(x) := \frac{x^2 - 2 \cdot x + 2}{x^3}$ 
  
Line 2:  $f(x) = \frac{d}{dx}(f(x))$ 
  
Line 3:  $f(x) = \frac{-(x^2 - 4 \cdot x + 6)}{x^4}$ 
  
The word "Done" is visible in the top right corner.

- ④ Open a new page by pressing **ctrl** and **+ page doc**. Select Add Graphs.
- ⑤ Write 'f1(x)=fd(x)', press **⏏**.
- ⑥ Choose an appropriate window (here Xmin=-10, Xmax=10, Ymin=-10 and Ymax=10 were chosen). The following should be displayed:

