Introducing Calculus – PART 2.

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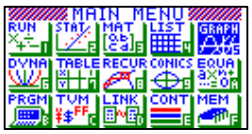
Select GRAPH mode from the main menu by using the arrow keys to highlight the GRAPH icon or pressing 5.

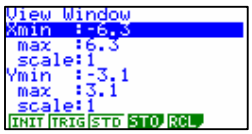


Seeing a curve being transformed into a straight line

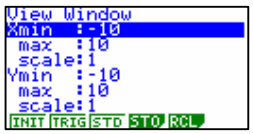
Calculus requires the student to visualise a tangent to a curve – you can simulate this by drawing a tangent to a curve, but seeing the curve changing as you ZOOM on a particular part (isolate) of the curve highlights the fact that any curve is a series of infinitesimally small pieces (piecewise) of straight lines.

DONOT forget to make the equation in question 'fit' onto the viewing screen before **ZOOMING** in.

SHIFT **F3** for the V-window.



INITial setting



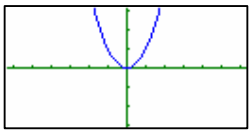
STandar**D** setting

And turn the derivative settings to **on**

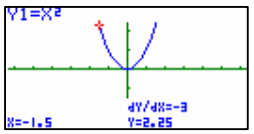
SHIFT **MENU**

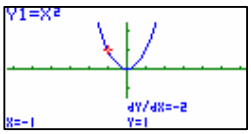
Example: Illustrate the graph of $y = x^2$ and then ZOOM in on the co-ordinate point (1,1)

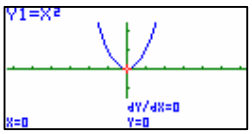
Type in the equation and draw the graph of $y = x^2$



SHIFT **F1** will trace the curve illustrating the co-ordinate point and also displaying the derivative at that point $^{dy}/_{dx}$

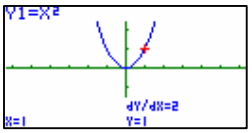




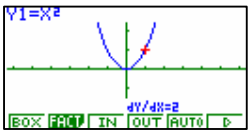


Moving the curser around the graph of $y = x^2$ using the ← and → arrows.

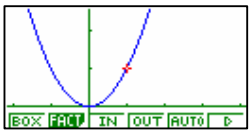
Move the cursor to (1,1)



Now **ZOOM** in on that point – press **SHIFT** F1 for **Trace** then **F3** for **IN.**



Keep pressing F3 each time the graph is redrawn to see the curve being 'straightened'.



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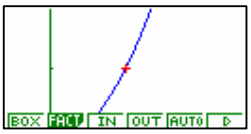

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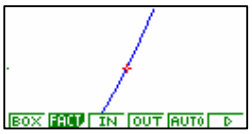

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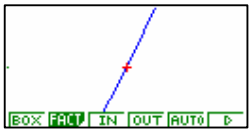

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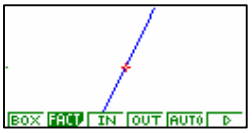
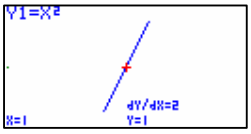
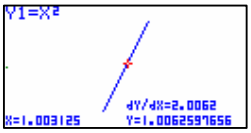
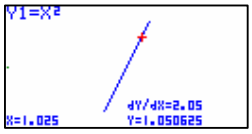


You can re-trace the curve at any time by pressing **SHIFT** **F1** for **Trace,** then use the ← and → arrows to move along the graph of $y = x^2$.

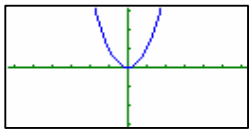




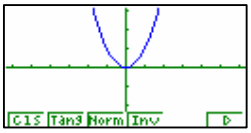


Drawing a tangent to a curve at (1,1):

Redraw the graph of $y = x^2$

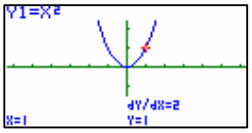


SHIFT **F4** for **Sketch.**

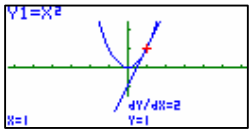


Then **F2** for **Tang**ent.

Using the ← or → arrows to move the cursor to (1,1).



Then **EXE** to draw in the tangent line.



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