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.

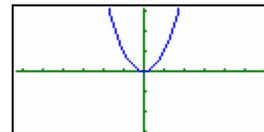|	
INITial setting	**ST**andar**D** setting

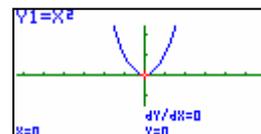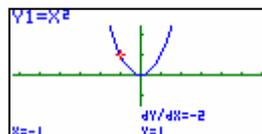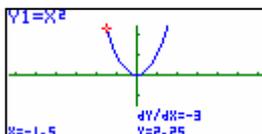And turn the derivative settings to **on**
SHIFT **MENU**

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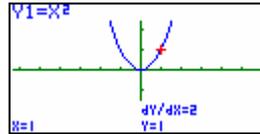
Type in the equation and draw the graph of $y = x^2$

SHIFT **F1** will trace the curve illustrating the co-ordinate point and also displaying the derivative at that point $\frac{dy}{dx}$
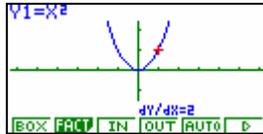
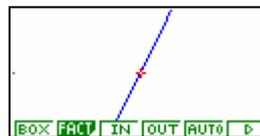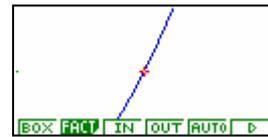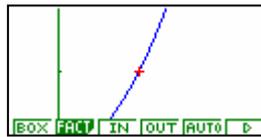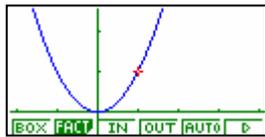Moving the curser around the graph of $y = x^2$ using the ← and → arrows.
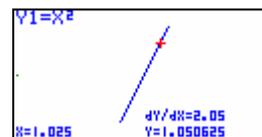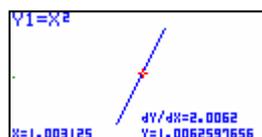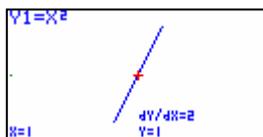
Move the cursor to (1,1)

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'.
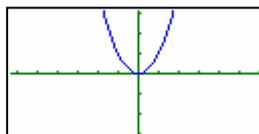
→ → →

→ →

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 = x².
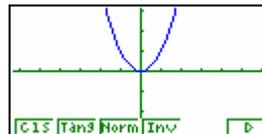
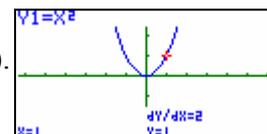# Drawing a tangent to a curve at (1,1):

Redraw the graph of y = x²

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.