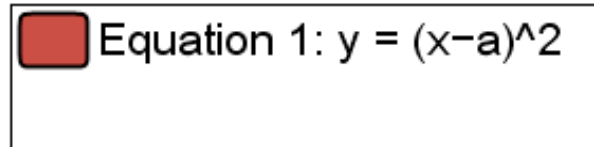
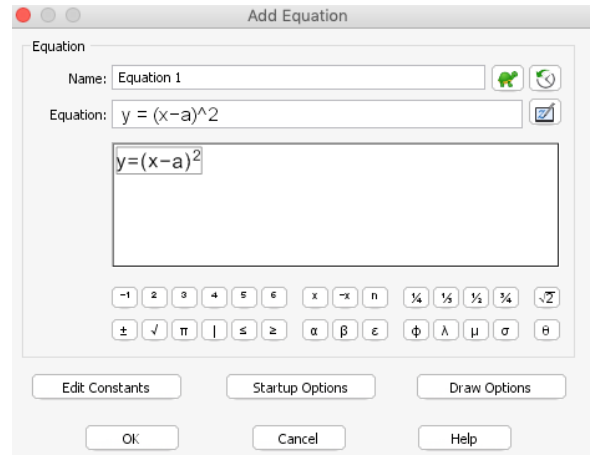
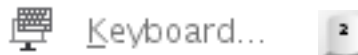


1. Enter Equation... $y = (x - a)^2$

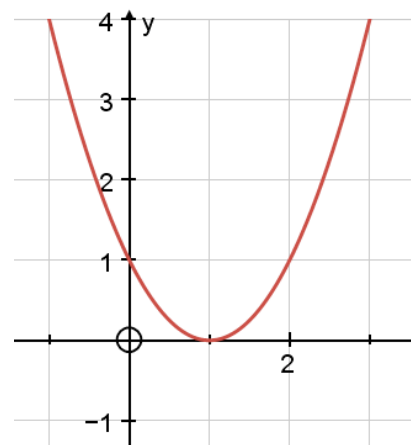


However you can use Keyboard

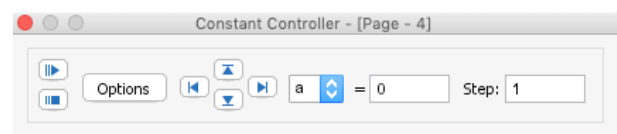


To get the superscript 2

2. The Graph $y = (x - a)^2$ will be drawn


















You can use the Constant Controller to change $a = 0$



3. Select the graph and right click

From the point option create the turning point.

-  Enter Equation...
-  Enter Point On Curve...
-  Text Box...
-  Calculation...
-  Edit Equation...
-  Edit Draw Options...
-  Edit Label...
-  Delete Object
-  Hide Object
-  Hide/Unhide Objects...
-  Show Label
-  Point
-  Create
-  Display Information
-  Table of Values







Solve $f(x) = 0$

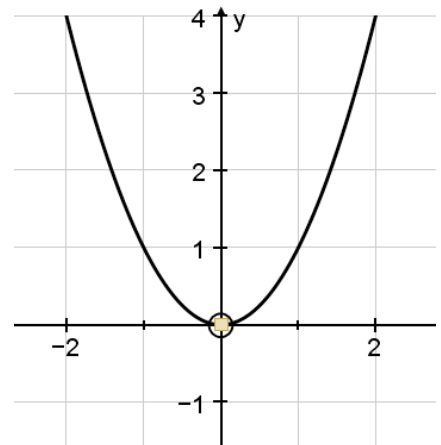
Turning Points

4. Create a point at the turning point using point mode.

Create a Vertical Line at this point.

Select **Ok**

-  Tangent
-  Normal
-  Horizontal Line
-  Vertical Line
-  Gradient Line
-  Fixed Length Line...



5. Click the calculator icon. .

In the Calculation box enter a

And in the **Before Text** enter $a =$

Use the **Constant Controller** to vary the value of a



Edit Calculation

Name
Calculation 1

Calculation
a π √

Before Text: a = |

After Text:

Show Working

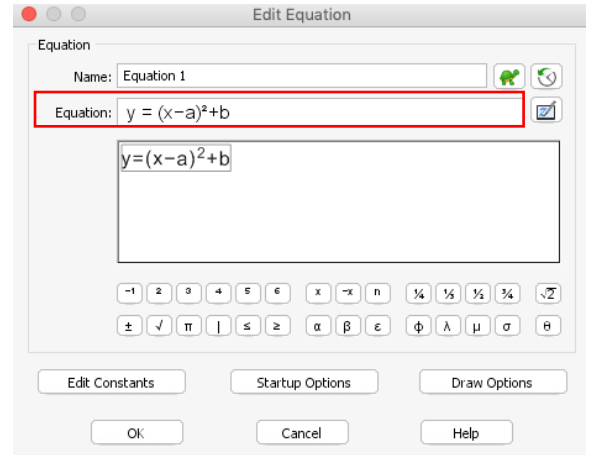
Preview
3

Edit Display Options

OK Cancel Help

6. Using **Select Mode** double click the graph. **Edit Equation** to be:

$$y = (x - a)^2 + b$$

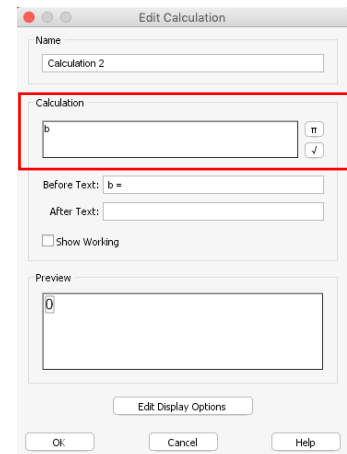


7. Click the calculator icon. .

In the Calculation box enter **b**

And in the **Before Text** enter **b =**

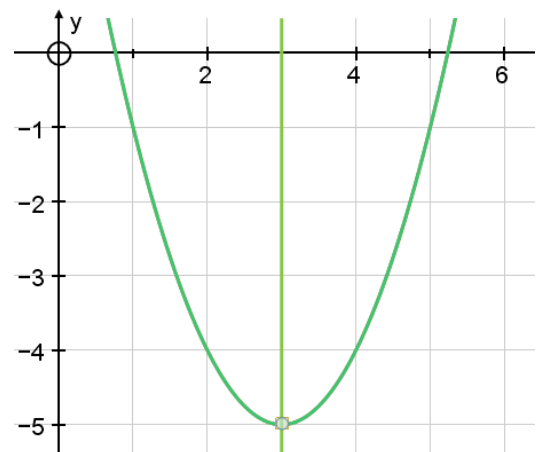
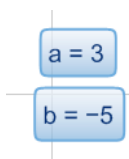
Use the **Constant Controller** to vary the value of **a** and **b**



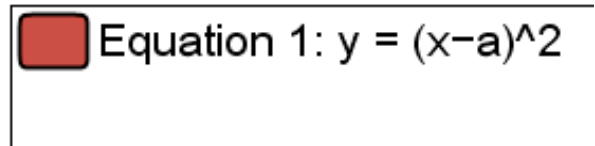
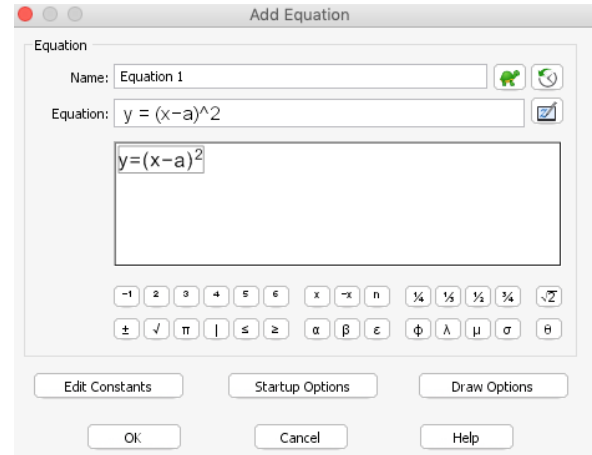
8. Enter Equation $y = (x - 3)^2 - 5$

Use the **Constant Controller** to vary the value
So that **a = 3** and **b = 5**

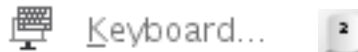
You should notice that the graphs are aligned.



9. Enter Equation... $y = (x - a)^2$

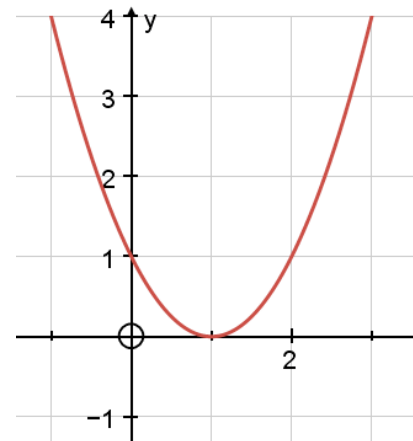


However you can use Keyboard

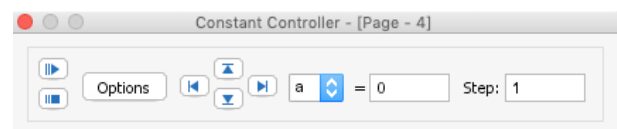


To get the superscript ²

10. The Graph $y = (x - a)^2$ will be drawn



You can use the Constant Controller to change $a = 0$



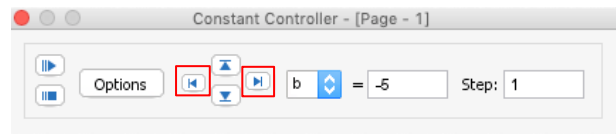
1. Use Autograph to find the values of **a** and **b** such you can write in the form:

$$y = (x - a)^2 + b$$

- a) $y = x^2 - 2x + 16$
- b) $y = x^2 + 8x + 15$
- c) $y = x^2 + 12x + 10$
- d) $y = x^2 + 5x - 2$

HINT

Adjust the Step using the left/right arrow in the constant controller



2. Use Autograph to find the values of **a** and **b** such you can write in the form:

$$y = (x - a)^2 + b$$

- a) $y = x^2 + \frac{1}{2}x + 1$
- b) $y = x^2 + 9x$
- c) $y = x^2 + 3x + 4$

3. Use Autograph to further investigate completing the square.