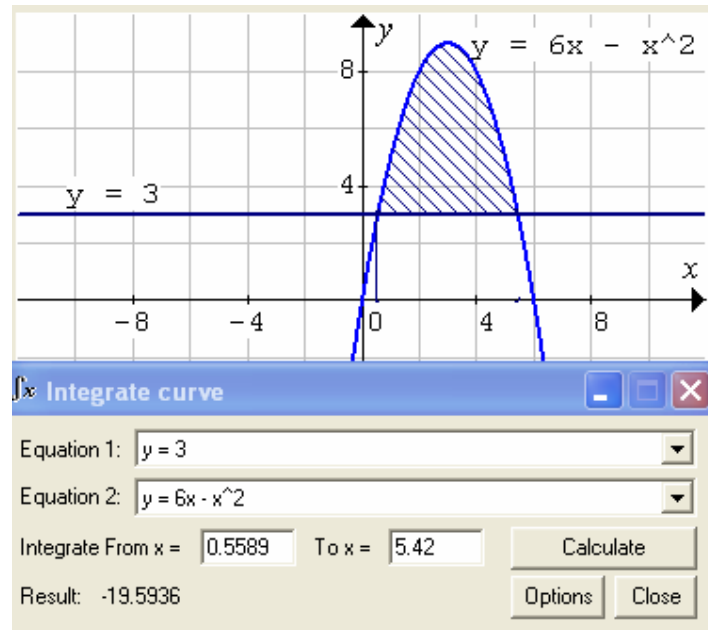


Using Graphmatica for a Math Investigation

Get a copy of Graphmatica - either from the Lab329 server in the Math folder, or by downloading from www.graphmatica.com . If you copy from Lab329, it probably runs without installation.

The graph below was drawn with Graphmatica.




This graph looks different than the standard settings. Find out how to do each of the following:

- Type in a formula for a graph
- Change the colors of the lines of the graph
- Make a nice grid in the background (graph paper)
- Label the axes with 2, 4, 6, 8
- Write labels on the graph ($y = 3$, $y = 6x - x^2$)
- Shade in the area between the curve and the line

Now get a copy of ScreenHunter, either from Lab329/download or from the site www.download.com Find out how to use it to cut out pictures of parts of the screen, for example the graph shown above.

Now do the following math investigations. You may start with either part A or part B, but you should do both.

Part A

1. Draw the graph of : $y = 6x - x^2$ ($y = 6x - x^2$)
Capture a picture and paste the picture into a word-document.
2. Use the **integral** button () to find the area between the curve and the x-axis. Write it down.
3. Write a label at the "top" of the curve (called the vertex), something like (3,7)
4. Add the line : $y = 5$.
5. Use the integral button to find the area between the curve and the straight line.
Capture a picture and paste it into the same word-document.;
6. The line $y = 5$ does **not** cut the area under the curve in half. Delete the line and draw a different line like $y = 4$. Does this cut the area under the curve in half?
7. Keep drawing different lines like $y = 3$, $y = 1.5$, $y = 2.79$ or any other line, until you find one that cuts the area under the curve in half.

Capture a picture and copy it into your word document. Write a brief explanation below, e.g. the formula for the curve and the formula for the line.

Part B

1. Start with a blank graph. Draw the graph of : $y = 2x - \frac{x^2}{2}$
2. Use the **integral** function to find the area between the curve and the x-axis. Write it down.
3. Erase the graph. Draw the graph of : $y = 3x - \frac{x^2}{3}$
4. Use the **integral** function to find the area between the curve and the x-axis. Write it down.
5. In you word-document, make a table like this to record the results for lots of curves. You must use the **equation editor** to write the formulas.

Formula	Area under curve
$y = 2x - \frac{x^2}{2}$	5.33
$y = 3x - \frac{x^2}{3}$
$y = 4x - \frac{x^2}{4}$
etc.	

Continue at least up to $6x - x^2/6$

Copy one of the graphs (with the area shaded) into your word-document, and write a short explanation about the experiment you performed.