

Risp 13: Introducing e

You will need a graphing package for this risp.

What do the following situations 1, 2 and 3 have in common?

1. Draw $y = x^{1/x}$.

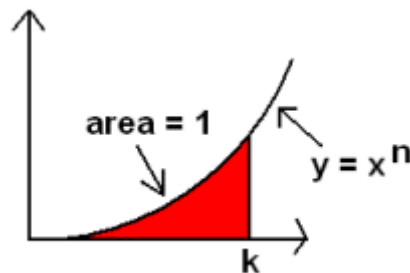
2. Draw $y = a^x$ together with its gradient function and vary a .

3. Draw $y = (1 + 1/x)^x$.

Pick a number between 0 and 3, call it n .

Draw the curve $y = x^n$ with your package.

Now k is the number so that the area between your curve and the x -axis between 0 and k is exactly 1.



Can you find k for your chosen value of n ?

Try to find k to three decimal places.

Use the constant controller to help you!

Now vary n within the interval $[0, 3]$. As n varies, k varies.

When will k be a maximum?

Can you draw up a table for n and k ?

What would a graph of k against n look like?

What happens as n tends to infinity?

Will there be any stationary points?

What range of values can k take?

Can you use the integration theory that you already know to explore this?