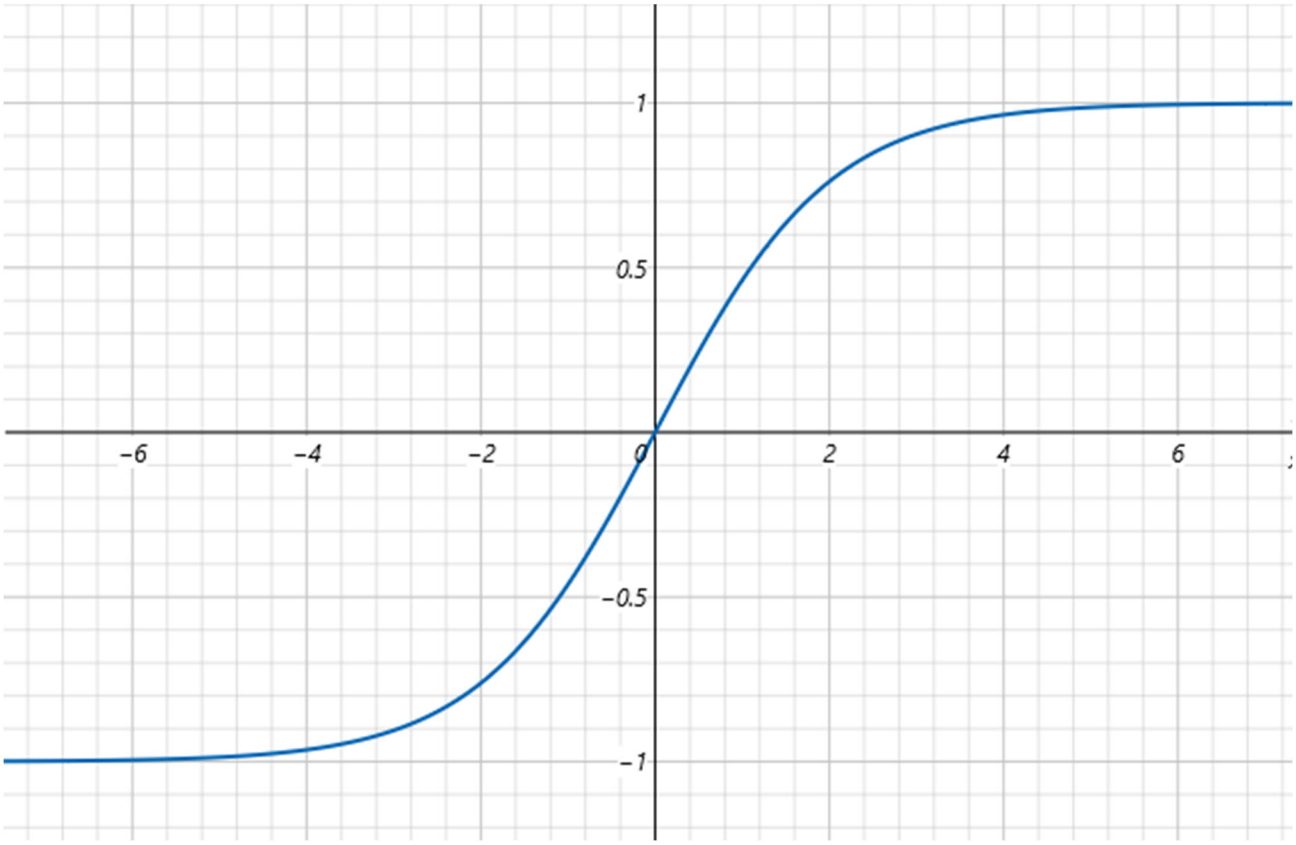
Scaling things that have an infinite range.

$$\frac{2}{1+e^{0-x}}-1$$

e is, as usual, the base of natural logarithms, 2.71828182845904523536028747135…



On the computer e^n is written exp(n)

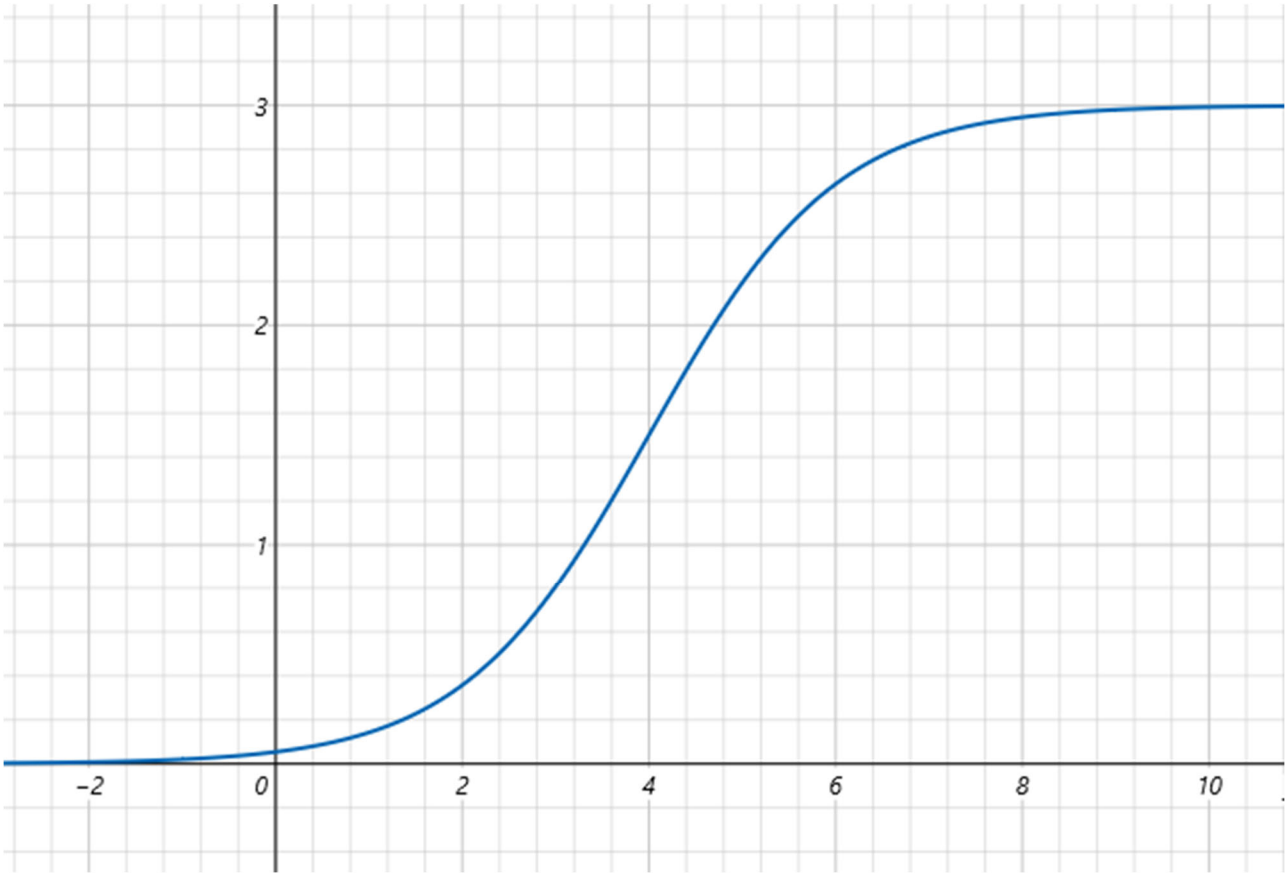
If you want to make it go higher (say between -7 and +7) just multiply the whole thing by 7.

If you don't want the vertical mid-point to be the x axis, just add your desired mid-point to the final result.

If you don't want the cross-over point to be the y axis, replace the zero in the formula with your desired cross-over x value.

For example (next page) I change the y range to 0 to 3 and make the half-way point be at x = 4.

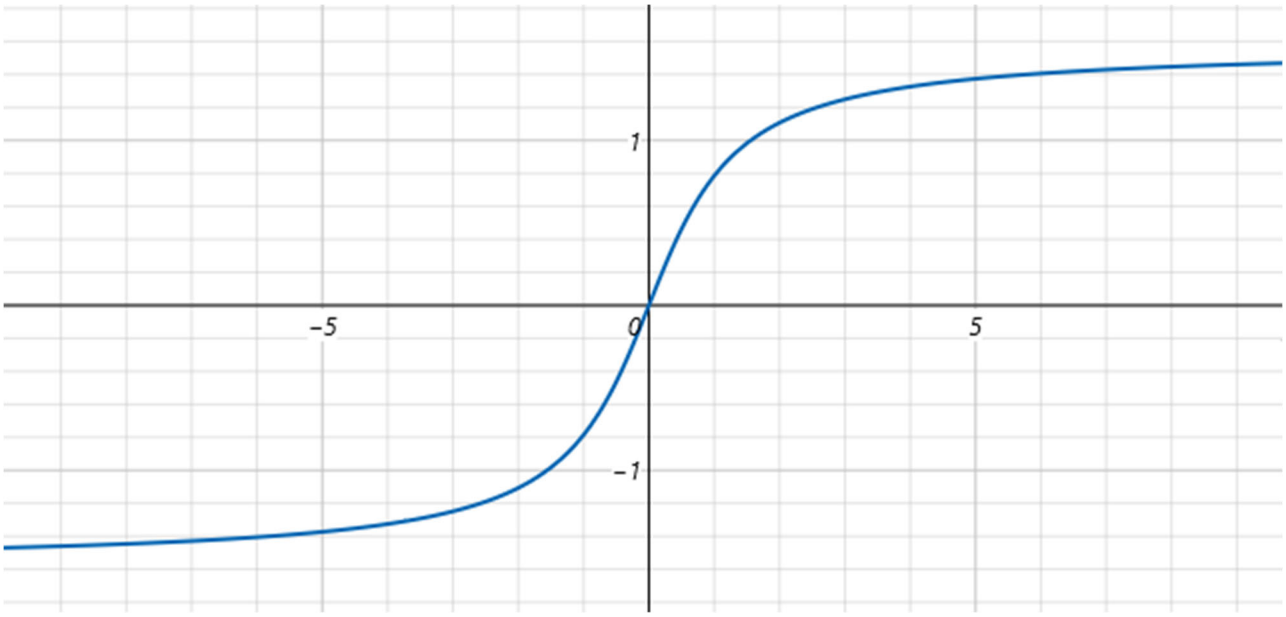
$$\left(\frac{2}{1+e^{4-x}}-1\right)\times 1.5+1.5$$



Another alternative …

$\arctan(x)$

On the computer, arctan(x) is written atan(x)



It is a similar shape, from small y to big y is sharper,
But the ends (as x shoots off the graph) flatten out much more gently.

The limiting values that y heads to as x gets bigger are of course $\pm\frac{\pi}{2}$

To move the cross-over point away from x = 0 to x = 3, turn it in to arctan(x – 3)