ADS1 exercises – Plotting and style check

1. Produce a plot of the hyperbolic functions `np.sinh()` and `np.cosh()` from -5 to 5. Add labels and legend and remove the white space on the left and right sides.

2. Define a function `trigon1(a, b, j)` which calculates the trigonometric polynomial

$$x = \cos(at) - \cos(bt)^j$$

   Use `np.linspace()` to create an array with values from 0 to 2π. Call the function with $a = 1$, $b = 60$ and $j = 3$ and plot it.

3. Also define a function `trigon2(c, d, k)` which calculates the trigonometric polynomial

$$y = \sin(ct) - \sin(dt)^k$$

   Call the first function again with $a = 1$, $b = 60$ and $j = 3$. Call the second function with $c = 1$, $d = 120$ and $k = 4$. Produce a plot with the first function values as x and the second function value as y. Add labels and change the shape of the figure to square. In case the line does not look smooth increase the number of points. Save the plot.

4. The program `approx_square.py` approximates a square wave with a Fourier series. The program contains several violations of the PEP-8 rules.

   - Inspect the code for violations of PEP-8 and correct by hand.
   - Spyder has a function autopep8 (in the Source menu). Download the duplicate program `approx_square_copy.py`. Activate autopep8 and inspect the resulting code and compare with the code amended by you. Are there any PEP-8 problems left?