import numpy as np

import matplotlib.pyplot as plt

# Activation functions

def relu(x):

return np.maximum(0, x)

def sigmoid(x):

return 1 / (1 + np.exp(-x))

def softmax(x):

exp\_x = np.exp(x - np.max(x))

return exp\_x / np.sum(exp\_x)

def tanh(x):

return (np.exp(x) - np.exp(-x)) / (np.exp(x) + np.exp(-x))

# Input range

x = np.linspace(-10, 10, 500)

# Plotting setup

funcs = [relu, sigmoid, softmax, tanh]

titles = ['ReLU', 'Sigmoid', 'Softmax (illustrative)', 'Tanh']

fig, axes = plt.subplots(2, 2, figsize=(12, 8))

for ax, func, title in zip(axes.flatten(), funcs, titles):

ax.plot(x, func(x))

ax.set(title=f'{title} Activation Function', xlabel='Input', ylabel='Output')

ax.grid(True)

plt.tight\_layout()

plt.show()