Homework 01

Problem 1 (2 points)
Find the value of the expression

$$(3.2)^4 - 1 + \ln(3) \tag{1}$$

where ln is the natural logarithm (use `log` in Matlab).

Problem 2 (3 points)
Find the value of the expression

$$\sin(2\pi + \pi/3) + \tan(\pi/8) \tag{2}$$

What variable name should you type to get numerical π representation? Does Matlab use degree or radians for angular measure?

Problem 3 (2 points)
Find the value of the expression

$$e^{\sin(\pi/4)} - \log_{10}(25) \tag{3}$$

Use `exp` for exponent function and `log10` for logarithm to the base of 10.

Problem 4 (2 points)
Find the value of the expression

$$\cos^2(\pi/3) \tag{4}$$

Notice that human/mathematical notation is quite different from what Matlab is expecting.

Problem 5 (4 points)
Find the largest number x (one significant digit is enough) such that the numerical evaluation of expression

$$(1 + x) - 1 \tag{5}$$

equals to zero. The value of x gives you an estimate of the relative uncertainty of your calculations with Matlab, try to keep it in mind when you do calculations. Note that x is actually rather small.

Problem 6 (4 points)
Find the value of the expression

$$20/3 - 20 \times (1/3) \tag{6}$$

Algebraically you should get zero. If your result is not zero, please, explain.

Problem 7 (3 points)
Find the numerical value of the expression

$$10^{16} + 1 - 10^{16} \tag{7}$$

with Matlab. Algebraically you should get 1. If your result is not 1, please, explain.