




1. Lab

Presentation of the Matlab programming environment

-  First, see in the lectures' part of the Laboratory manual (polycopié des TPs), the counterpart chapter of this Lab.

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1. Launch Matlab and explore the different Matlab desktop windows.
2. Do the basic calculations given in listings 1.1–1.5, and check that you get the correct answers.

```
1 >> 4+3
2 ans =
3 7
```

Listing 1.1: Addition

```
1 >> 2^2
2 ans =
3 4
```

Listing 1.2: Power

```
1 >> sin(2*pi)+exp(-3/2)
2 ans =
3 0.2231
```

Listing 1.3: Trigonometry

```
1 >> 5+5j
2 ans =
3 5.0000 + 5.0000i
```

Listing 1.4: Complex numbers

Listing 1.5: More trigonometry

```

1 >> atan(5/5)
2 ans =
3 0.7854
4
5 >> 10*log10(0.5)
6 ans =
7 -3.0103

```

3. *Arithmetic operations : calculate the following :*

(a) $\frac{2^5}{2^5-1}$ and compare the result $(1 - \frac{1}{2^5})^{-1}$

(b) $\frac{\sqrt{5}-1}{(\sqrt{5}+1)^2}$

[Answers : 1.0323, 1.0323, 0.1180].

4. *Exponentials and logarithms : calculate the following :*

(a) e^3

(b) $\ln(e^3)$

(c) $\log_{10}(e^3)$

(d) $\log_{10}(10^5)$

[Answers : 20.0855, 3, 1.3029, 5].

5. *Trigonometric operations : calculate the following :*

(a) $\sin(\frac{\pi}{6})$

(b) $\cos(\pi)$

(c) $\tan(\frac{\pi}{2})$

(d) $\sin^2(\frac{\pi}{6}) + \cos^2(\frac{\pi}{6})$

[Answers : 0.5, -1, 1.6331E16, 1].

6. *Operators' precedence : Use parentheses in a way that allows you to find the results given below.*

(a) $\frac{123*456}{123+456}$.

(b) $2 * \frac{\frac{1}{2} + \frac{1}{3} + \frac{1}{6}}{\frac{1}{3} + \frac{1}{5} + \frac{1}{6}}$.

(c) $\frac{1}{12-6^2} + \frac{2}{3}$.

(d) $\frac{1+(\frac{2}{3})^{\frac{1}{2}}}{12-6^2}$

[Answers : 97.8705, 0.6087, 0.625, -0.0757].