

## Course reader: *Calculator and colon operator*

- MATLAB is like a fancy calculator. That means you can also use it like a simple calculator. This is a good way to gain initial familiarity with using MATLAB.
- You can type equations into the Command Window and press Enter to see the result. For example, type `1+3*4`
- The math using symbols are what you might expect them to be (+, -, \*, /). A power ( $3^2$ ) is indicated with the carot symbol: `3^2`.
- Spacing is useful to make lines of code easier to read. Consider the following two lines:  
`5+6^2*4/5+2`  
`5 + 6^2 * 4/5 + 2`  
Both lines produce the same result; the second one is easier for a human to read (and debug!).
- You can also use parentheses to improve code readability:  
`5+6^2*4/5+2`  
`5+(6^2)*(4/5)+2`
- Parentheses can also be used to override order-of-operations. Type these two equations into MATLAB to see:  
`3^1+1` (same as `(3^1) + 1`)  
`3^(1+1)` (same as `3^2`)
- The colon operator is used to count from one number to another, skipping by some amount (default skip is 1). Examples:  
`0:3` → 0 1 2 3  
`0:.2:.9` → 0 .2 .4 .6 .8  
`1:-1:-3` → 1 0 -1 -2 -3

## Exercises

1. Compute the following equations (use parentheses to group terms!):

**a)**  $4 + 5 \times \frac{2}{16+3}$       **b)**  $14^{23} \times 95^{-4} - \frac{14^{95}}{15^{94}}$       **c)**  $(40+70-3 \times \frac{40}{70})\frac{40}{70}$       **d)**  $\frac{-4+2^3-.48}{3^{2.2} \times 17.3}$

2. Use the colon operator to obtain the following number sequences.

**a)** 1 2 3 4      **b)** -4 -3.5 -3 -2.5 -2      **c)** 10 20 30 40 50 60 70  
**d)** -4 15 34 53      **e)** 100 91 82 73 64 55 46      **f)** 0 5 10 15 20

3. Do the following line-pairs of MATLAB code produce different results? First think of your answer and then confirm by testing in MATLAB.

**a)** 1:2:6      **b)** 1:15:30      **c)** 10:15:30  
    0:2:6      1:15:36      10:15:31

## Answers

1. This is the MATLAB code, not the numerical answers.

**a)**  $4+5*(2/(16+3))$

**b)**  $14^{23} * 95^{-4} - (14^{95})/(15^{94})$

**c)**  $(40+70-3*(40/70))*(40/70)$

**d)**  $(-4+2^3-.48)/(3^{2.2} * 17.3)$

2. .

**a)**  $1:4$

**b)**  $-4:.5:2$

**c)**  $10:10:70$

**d)**  $-4:19:53$

**e)**  $100:-9:46$

**f)**  $0:5:20$

3. .

**a)** Different

**b)** Different

**c)** Same