

1. With  $x = 5$  and  $y = 2$ , compute the following quantities:

- $u = x + y$     $v = xy$     $w = x/y$     $z = w^3$
- $s = xy^2/(x - y)$     $p = 3x/2y$     $r = 3xy/2$     $t = x^5/(x^5 - 1)$

2. With  $x = 10$  and  $y = 3$ , compute the following quantities:

- $r = 8 \sin(y)$     $s = 5 \sin(2y)$     $z = \sin(x)$
- $w = 2(\sin(x))/5$     $p = e^{x-1}$     $u = 2 + \cos(2\pi x)$     $m = \sqrt{x} + 4 + \sin(0.2\pi) + e^2$

3. With  $x = 3$  and  $y = 4$ , compute the following quantities:

$$\frac{3}{2}xy \quad \left(1 - \frac{1}{x^5}\right)^{-1} \quad \frac{4(y-5)}{3x-6}$$

Then compute the same quantities as above with:

- $x = [3 \ 1 \ 0]'$  and  $y = [0 \ 1 \ 1]'$ . *Vector element-by-element Arithmetics*
- $x = \begin{bmatrix} -3 & 1 & 0 \\ 1 & 0 & 1 \end{bmatrix}$  and  $y = \begin{bmatrix} 1 & 1 & 1 \\ 2 & 0 & -2 \end{bmatrix}$ . *Array element-by-element Arithmetics*

4. With  $A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \end{bmatrix}$ , perform the following operations:

- (a) Extract the 3rd column of matrix  $A$  and store it in vector  $B$ .
- (b) Extract the 1st and 3rd columns of matrix  $A$  and store them in matrix  $C$ .
- (c) Add the 1st and 3rd rows of matrix  $A$  together and store the result in vector  $D$

- (d) Change the value in the 2nd row and 3rd column of  $A$  to 7 (instead of +7) and call the result  $AA$  (do not destroy/change the original  $A$  matrix).
- (e) Create a matrix that contains rows 1 and 3 from  $A$ , the second row of  $AA$ , and the result of step (c). The resultant 4x4 matrix should be

$$BB = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 9 & 10 & 11 & 12 \\ 5 & 6 & -7 & 8 \\ 10 & 12 & 14 & 16 \end{bmatrix}$$

5. Find a *short* MatLab expression to build the matrix:

$$A = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 9 & 7 & 5 & 3 & 1 & -1 & -3 \\ 4 & 8 & 16 & 32 & 64 & 128 & 256 \end{bmatrix}$$