

1. Given a vector v , write one line of Matlab code that returns its 1st, 2nd, and 9th elements.
2. Given a 3×5 matrix A , write one line of Matlab code that sets its third column to a vector with elements 5, 7, and 2.
3. Write one line of Matlab code that creates an anonymous function that computes the value of the polynomial $4x^3 + 3x^2 - 2x - 7$ for an input argument x .
4. How would you use Matlab and the anonymous function from problem 3 to find a numerical solution to the equation $4x^3 + 3x^2 - 2x - 7 = 0$? One line of code should do it.
5. Write a few lines of Matlab code that would plot $y = e^{-4x} \sin(2x)$ versus x for $-2 \leq x \leq 2$ as a green line with a superimposed grid. Label your axes.

6. Write one line of Matlab code that evaluates to 1 (true) if x is less than 4 and y greater than or equal to 6, and 0 (false) otherwise.

7. Write a few lines of Matlab code that would evaluate the following sum for the value $x = \pi/6$.

$$\sum_{n=0}^{20} (-1)^n \frac{x^{2n}}{(2n)!}$$

8. Write Matlab code that would solve the system of equations.

$$3x + y + 2z - 6 = 0$$

$$9z - x - 8 = 0$$

$$5y - 4x - 1 = 0$$

9. Write a Matlab function that computes the mean (i.e. average) of the components of a vector x according to the formula

$$\text{mean}(x) = \frac{1}{N} \sum_{i=1}^N x_i$$

where N is the length of the vector. Your function should evaluate this sum directly using a `for` loop, not by calling Matlab's `sum` or `mean` function.

10. What is y as a function of x ? Give an explicit formula for $y(x)$ with specific numerical constants.

