**Functions (generally) operate on zero or more inputs to return one or more outputs.**

|  |
| --- |
| function [output\_1, output\_2,...output\_m] = fcn(input\_1, input\_2,...input\_n)  output\_1 = some function of any combination of the inputs input\_1, input\_2,...input\_n  output\_2 = some function of any combination of the inputs input\_1, input\_2,...input\_n  ...  output\_m = some function of any combination of the inputs input\_1, input\_2,...input\_n  end |

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| --- | --- |
| **Ex 1. A function that takes input x and outputs a point on the parabola y = x2+2x+1**  function y = f(x)  y = x^2+2\*x+1;  end | **Ex 2. A function with three inputs and two outputs**  function [y1, y2] = fxn1(x1, x2, x3)  y1 = x1-x3;  y2 = x2+2\*x1;  end |

**Ex 3. A function that adds together the minimum element of x1 and the maximum element of x2**

function z = fxn2(x1, x2)

z = min(x1) + max(x2);

end

|  |  |  |
| --- | --- | --- |
| **A. What are the inputs?**  **x1, x2** | **B. What are the outputs?**  **z** | **C. What is the function’s name?**  **fxn2** |
| **D. What does the function do? (Write your answer above in the Ex 3 title!)** | | |
| **E. What would you get if you entered fxn2([3 2 8], 3) into the command window? 5** | | |

**Checking Your Functions**

* To call a function (eg, to check its output), type function\_name(input\_1,input\_2...input\_n)into your command window.
  + eg, if I wanted to check the output in Ex 3 when x1 = [4 6] and x2 = [-2 8] I would type into the command window: fxn2([4 6],[-2 8])
    - If the function is working correctly, this should return ans = 12.
  + Make sure you enter something for each input, or you will get an error that says you have not entered enough input arguments.
* If your function has multiple outputs, typing in the above line of code will only let you see the first output. To see all of your function’s outputs, type into your command window:
* [output\_1,output\_2,...output\_m] = function\_name(input\_1,input\_2...input\_n)
  + eg, if I wanted to check the output in Ex 2 when x1 = 1, x2 = -3, and x3 = 6, I would type into the command window: [name1, name2] = fxn1(1,-3,6)
    - If the function is working correctly, this should return name1 = -5 and name2 = -1.
  + Note that I can name the outputs whatever I want. MATLAB will store the output values into your workspace as whatever you decide to call the output variables.
* Make sure you have not suppressed the statement with a semicolon if you are checking the output in the command window.

|  |  |
| --- | --- |
| **Practice 1: A function does not necessarily have to have an input. Consider the line y = 2. How would you write this into a MATLAB function with no inputs?[[1]](#footnote-0) How would you write this into a MATLAB function with one input?[[2]](#footnote-1)** | **Practice 2: Write a function called *tempconvert* that converts its input, in degrees Fahrenheit, into two outputs: one in Kelvin and one in Celsius.[[3]](#footnote-2)** |

1. function y = f()

   y = 2;

   end [↑](#footnote-ref-0)
2. function y = f(x)

   x = 2;

   y = x;

   end [↑](#footnote-ref-1)
3. function [C, K] = tempconvert(F)

   C = (F-32)\*(5/9);

   K = C+273.15;

   end [↑](#footnote-ref-2)